

DAFTAR PUSTAKA

- Adib, M., Habib, N., Bashter, I. I., El-mesiry, M. S., & Mansy, M. S., 2016, Simulation study of accelerator based quasi-mono-energetic epithermal neutron beams for BNCT. *Applied Radiation and Isotopes*, 107, 98–102.
- Ahmed, S. N., 2015, *Physics & Engineering of Radiation Detection* 1st ed. Ontario: Elsevier.
- Akan, Z., Türkmen, M., Çakir, T., Reyhancan, I. A., Çolak, Ü., Okka, M., & Kizilta, S., 2015, Modification of the radial beam port of ITU TRIGA Mark II research reactor for BNCT applications. *Applied Radiation and Isotopes*, 99, 110–116.
- Allen, D. A., & Beynon, T. D., 1995, A design study for an accelerator-based epithermal neutron beam for BNCT. *Phys. Med. Biol.*, 40, 807-821.
- Amato, E., Lizio, D., & Baldari, S., 2013, Applications of the monte carlo method in medical physics. In *Medical Physics*. Nova Science Publishers, Inc.
- Altieri, S., & Protti, N., 2018, A brief review on reactor-based neutron sources for boron neutron capture therapy. *Therapeutic Radiology and Oncology*, 2, 1-8.
- Anderson, I. S., Andreani, C., Carpenter, J. M., Festa, G., Gorini, G., Loong, C., & Senesi, R., 2016, Research opportunities with compact accelerator-driven neutron sources. *Physics Reports*, 654, 1–58.
- Ardana, M., & Sardjono, Y., 2017, Optimization of a neutron beam shaping assembly design for BNCT and its dosimetry simulation based on MCNPX, *J. Tek. Reaktor. Nukl.* 19(3), 121-130.
- Aghara, S. K., Sriprisan, S. I., Singleterry, R. C., & Sato, T., 2015, Shielding evaluation for solar particle events using MCNPX, PHITS and OLTARIS codes. *Life sciences in space research*, 4, 79-91.
- Ashayer, S, Asgari, M., & Afarideh, H., 2010, Optimizing gamma-ray shielding material by using genetic algorithm andMCNP code, *Proceedings of the 18th International Conference on Nuclear Engineering*, 17-21
- Asnal, M., Liamsuwan, T., & Onjun, T., 2015, An Evaluation on the design of beam shaping assembly based on the D-T reaction for BNCT. *Journal of Physics: Conference Series*, 611, 1-7.
- Auterinen, I., Seren, T., Anttila, K., Kosunen, A., & Savolainen, S., 2004, Measurement of free beam neutron spectra at eight BNCT facilities worldwide. *Applied radiation and isotopes*, 61(5), 1021-1026.
- Bavarnegin, E., Kasesaz, Y., & F.M. Wagner, M. F., 2017, Neutron beams implemented at nuclear research reactors for BNCT, *JINST* 12 PO5005.
- Belousov, S., Mitev, M., Ilieva, K., Riley, K., & Harling, O., 2011, IRT-Sofia BNCT beam tube optimization study. *Applied Radiation and Isotopes*, 69(12), 1936–1939.
- Bilalodin, Kusminarto, Hermanto, A., Sardjono, Y., & Sunardi, 2017, Double Layer Collimator for BNCT Neutron Source Based on 30 MeV Cyclotron, *Indonesian journal of physics and nuclear application*, 2 (3), 124-127.

- Bilalodin, Kusminarto, Suparta, G. B., Hermanto, A., Palupi, D. S., & Sardjono, Y., 2018, Optimization of Double Layered Beam Shaping Assembly Using Genetic Algorithm. *Polish Journal of Medical Physics and Engineering*, 24, 157-164.
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., and Sardjono, Y., & Rasito, 2019a, Optimization and Analysis of Neutron Distribution on 30 MeV Cyclotron-Based Double Layer Beam Shaping Assembly (DLBSA), *Nuclear Physics and Atomic Energy*, 20, 70-75.
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., and Sardjono, Y., & Rasito. 2019b, Characteristics of Thermal Neutron Flux Distribution in a Phantom Irradiated by Epithermal Neutron Beam From Double Layer Beam Shaping Assembly (DBSA), *Pakistan Journal of Scientific and Industrial Research*, 62A(3), 167-173.
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., and Sardjono, Y., & Rasito. 2019c, Characteristics in Water Phantom of Epithermal Neutron Beam Produced by Double Layer Beam Shaping Assembly, *ASEAN Journal on Science & Technology for Development*, 36, No 1, 9–12.
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., & Sardjono, Y., 2019d, Analysis of Particle Distribution in a Double Layer Beam Shaping Assembly Resulted From 30 MeV-Proton Reactions with Beryllium Target Using The PHITS Program, *Jurnal Teknologi*, (Second review).
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., Sardjono, Y., & Rasito., 2019e, Verification of Neutron Beam Parameters in Double Layer BSA Using the PHITS Code, *5th International Symposium on the Application of Nuclear Technology as a Key Element to Promote Competitive National Industrial Products: Energy, Health, Agriculture, Industry and Environment*. Universitas Negeri Semarang.
- Bilalodin, Suparta, G. B., Hermanto, A., Palupi, D. S., and Sardjono, Y., 2019f, Review on designs of double layer beam shaping assembly (BSA) for epithermal neutron generation. *3rd PIT-FMB and the 17th SEACOMP*, Bali.
- Bortolussi, S., Postuma, I., Protti, N., 2017, Understanding the potential of accelerator based boron neutron capture therapy for osteosarcoma: dosimetry assesment based on the reported clinical experience, *Radiation Oncology*, 12(1), 30
- Briesmeister, J. F., 2000, *MCNPTM General Monte Carlo N-Particle Transport Code*, Version 4C. LA-13709-M.
- Burlon, A. A., Girola, S., Valda, A. A., Minsky, D. M., Kreiner, A. J., & Sa, G., 2011, Design of a beam shaping assembly and preliminary modelling of a treatment room for accelerator-based BNCT at CNEA, *Applied Radiation and Isotopes*, 69,1936–1939.
- Chadwick, M. B., Obložinský, P., Herman, M., Greene, N. M., McKnight, R. D., Smith, D. L., & Kahler, A. C. 2006. ENDF/B-VII. 0: next generation evaluated nuclear data library for nuclear science and technology. *Nuclear data sheets*, 107(12), 2931-3060.
- Cheng, D. W., Wang, H. D., Lu, J. Bin, Ma, K. Y., & Yang, D., 2012, Improvement of the moderator's thermalization efficiency for 14 MeV

- neutrons in boron neutron capture therapy. *Journal of Radioanalytical and Nuclear Chemistry*, 292(3), 1085–1088.
- Capoulat, M. E., Herrera, M. S., Minsky, D. M., González, S. J., & Kreiner, A. J. 2014, ^9Be (d, n) ^{10}B -based neutron sources for BNCT. *Applied radiation and isotopes*, 88, 190-194.
- Cugnon, J., Boudard, A., Leray, S., & Mancusi, D., 2011, New features of the INCL4 model for spallation reactions. *Journal of Korean Physical Society*, 59(2), 955-958.
- Daqian, H., Haocheng, Z., Wenbao, J., Can, C., Hongtao, W., & Da, C., 2016, Nuclear instruments and methods in physics research B design of a setup for purpose. *Nuclear Inst. and Methods in Physics Research, B*, 386, 1–3.
- Didi, A., Dadouch, A., Jaï, O., Tajmouati, J., & El Bekkouri, H., 2017, Neutron activation analysis: Modelling studies to improve the neutron flux of Americium–Beryllium source. *Nuclear Engineering and Technology*, 49(4), 787-791.
- Faghihi, F., & Khalili, S., 2013, Beam shaping assembly of a D – T neutron source for BNCT and its dosimetry simulation in deeply-seated tumor. *Radiation Physics and Chemistry*, 89, 1–13.
- Fantidis, J. G., & Antoniadis, A., 2015, Optimization study for BNCT facility based on a DT neutron generator. *Int. J. Radiat. Res*, 13(1), 13-24.
- Fantidis, J. G., & Nicolaou, G., 2018, Optimization of beam shaping assembly design for boron neutron capture therapy based on a transportable proton accelerator, *Alexandria Engineering Journal*, 57 (4), 2333-2342.
- Ghal-Eh, N., Goudarzia, H., Rahmani, F., 2017, FLUKA simulation studies on in phantom dosimetric parameters of a LINAC-based BNCT. *Radiation Physics and Chemistry*, 141: 36–40.
- Ghassoun, J., 2007, On the ^{252}Cf primary and secondary gamma rays and epithermal neutron flux for BNCT, *Nuclear Instrument and Methods in Physics Research B*, 236, 231–233.
- Gritzay, O. O., Kalchenko, O. I., Klimova, N. A., Razbudey, V. F., Sanzhur, A. I., & Binney, S. E., 2004, Monte-Carlo calculations for the development of a BNCT neutron source at the Kyiv Research Reactor. *Applied Radiation and Isotopes*, 615, 869–873.
- Hadad, K., Nematollahi, M., & Sadeghpour, H., 2016, Direct moderation and shielding optimization for a ^{252}Cf based prompt gamma neutron activation analyzer system. *International Journal of Hydrogen Energy*, 1–6.
- Hang, S., Tang, X., Shu, D., Liu, Y., Geng, C., Gong, C., Chen, D., 2016, . Monte Carlo study of the beam shaping assembly optimization for providing high epithermal neutron flux for BNCT based on D-T neutron generator. *Journal of Radio Analytical and Nuclear Chemistry*, 310(3), 1289–1298.
- Hashimoto, Y., Hiraga, F., & Kiyonagi, Y., 2014, Effects of proton energy on optimal moderator system and neutron-induced radioactivity of compact accelerator-driven ^9Be (p, n) neutron sources for BNCT. *Physics Procedia*, 60, 332-340.
- Harling, O. K., 2009, Fission reactor based epithermal neutron irradiation facilities for routine clinical application in BNCT-Hatanaka memorial

- lecture. *Applied Radiation and Isotopes*, 677-8 SUPPL., 7–11.
- Harada, M., Maekawa, F., Oikawa, K., Meigo, S. I., Takada, H., & Futakawa, M. 2011. Application and validation of particle transport code PHITS in design of J-PARC 1 MW spallation neutron source. *Prog in Nucl Sci and Technol*, 2, 872-878.
- Hererra, M.S., Gonzales, S. J., Burlon, A. A., Minsky, D. M., Kreiner, A. J., & Gonza, S. J., 2011, Treatment planning capability assessment of a beam shaping assembly for accelerator-based BNCT, *Applied Radiation and Isotopes*, 69, 1870–1873
- Hignett, C., Evett, S. R., Dane, J. H., Topp, G. C., 2002, Neutron thermalization. *Methods of soil analysis, Part 4*:501-521.
- Hofler, A., Terzi, B., Kramer, M., Zvezdin, A., Morozov, V., Roblin, Y., & Jarvis, C., 2013, Innovative applications of genetic algorithms to problems in accelerator physics. *Physical Review Special Topics-Accelerators and Beams*, 16(1), 010101.
- Holloway, J. P., 2015, Designing shields for keV photons with genetic algorithms, International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering, Rio de Janeiro, RJ, Brazil, 1-9.
- Hu, G., Hu, H. S., Wang, S., Pan, Z. H., Jia, Q. G., Yan, M. F., Yan, M. F., 2016, The “neutron channel design”—A method for gaining the desired neutrons, *AIP Advances* 6, 1-12.
- IAEA, 2001, *Current status of neutron capture therapy*, Tecdoc 1223, Vienna Austria.
- ICRU Report 63, 2000. *Nuclear Data for Neutron and Proton Radiotherapy and for Radiation Protection*. International Committee on Radiation Units and Measurements, Bethesda, MD.
- Ivakhin V.S., Tikhomirov G.V., Bolozdynya, A. I., 2011, Modeling of Filters for Formation of Mono-Energetic Neutron Beams in the Research Reactor IRT MEPhI. *Proceedings of GLOBAL*. Makuhari, Japan.
- Iwase, H., Niita, K., & Nakamura, T., 2002, Development of general-purpose particle and heavy ion transport Monte Carlo code. *Journal of Nuclear Science and Technology*, 39(11), 1142-1151.
- Karni, Y., Greenspan, E., Vujic, J., 1997, Perturbation-theory-guided design of beam-shaping assemblies. *Journal Transactions of the American Nuclear Society Transactions of the American Nuclear Society*, 77, 354–355.
- Kasesaz, Y., Bavarnegin, E., Golshanian, M., Khajeali, A., Jarahi, H., Mirvakili, S. M., & Khalafi, H., 2016, BNCT project at Tehran Research Reactor: Current and prospective plans. *Progress in Nuclear Energy*, 91, 107–115.
- Kasesaz, Y., Khalafi, H., & Rahmani, F., 2013, Optimization of the beam shaping assembly in the D–D neutron generators-based BNCT using the response matrix method. *Applied Radiation and Isotopes*, 82, 55-59.
- Kasesaz, Y., Khalafi, H., & Rahmani, F., 2014, Design of an epithermal neutron beam for BNCT in thermal column of Tehran research reactor. *Annals of Nuclear Energy*, 68, 234–238.
- Kasesaz, Y., Khalafi, H., Rahmani, F., Ezzati, A., Keivany, M., Hosnirokh, A., ... Monshizadeh, S. M., 2014, A feasibility study of the Tehran research reactor

- as a neutron source for BNCT. *Applied Radiation and Isotopes*, 90, 132–137.
- Khorshidi, A., 2017, Accelerator driven neutron source design via beryllium target and ^{208}Pb moderator for boron neutron capture therapy in alternative treatment strategy by Monte Carlo method, *Journal of Cancer research and therapeutic*, 13(3):456-465
- Kim, J. K., & Kim, K., 2009, Current research on accelerator-based boron neutron capture therapy in Korea, *Nuclear Engineering and Technology - Special Issue in Celebration of the 40th Anniversary of the Korean Nuclear Society* 414, 531–544.
- Kim, S. B., & Moon, H. J., 2010, Use of a genetic algorithm in the search for a near-optimal shielding design, *Annals of Nuclear Energy* 37, 120–129,
- Koivunoro, H., Bleuel, D. L., Nastasi, U., Lou, T. P., Reijonen, J., & Leung, K. N., 2004, BNCT dose distribution in liver with epithermal D-D and D-T fusion-based neutron beams. *Applied Radiation and Isotopes*, 615, 853–859.
- Kolsek, A., Radulovic, V., Trkov, A. dan Snoj, L., 2015, Using TRIGA Mark II research reactor for irradiation with thermal neutrons, *Nuclear Engineering and Design*, 283, 155-161.
- Konak, A., Coit, D. W., & Smith, A. E., 2006, Multi-objective optimization using genetic algorithms : A tutorial, 91, 992–1007.
- Koreshi, Z. U., & Khan, H., 2016, Optimization of moderator design for explosive detection by thermal neutron activation using a genetic algorithm, *Journal of Nuclear Engineering and Radiation Science* 2, 1–7.
- Koay, HW., 2018, Conceptual design of a compact accelerator base neutron generator for multi BNCT system, Research Center for nuclear physics, Osaka University.
- Kumada, H., Matsumura, A., Sakurai, H., Sakae, T., Yoshioka, M., & Kobayashi, H., 2014, Project for the development of the linac based NCT facility in University of Tsukuba. *Applied Radiation and Isotopes*, 4, 1–5.
- Lamarsh, J. R., 1972, *Theory of Nuclear Reactors and Engineering*, 3rd ed.. New Jersey: Prentice Hall.
- Lamarsh, J. R., & Barata, A. J., 2001, Isotope Separation. *Introduction to Nuclear Engineering*, 201-205.
- Laxdal, R., 2017, *Introduction and Overview of High Energy Accelerators*, Regional Accelerator School (RAS), Yogyakarta, Indonesia.
- L'Annunziata, M. F. (Ed.), 2012, *Handbook of radioactivity analysis*. Academic press.
- Leung, K. N., 2012, Compact neutron generator for BNCT. In *Neutron Capture Therapy* (pp. 55-67). Springer, Berlin, Heidelberg.
- Liu, Y. W. H., Huang, T. T., Jiang, S. H., & Liu, H. M., 2004, Renovation of epithermal neutron beam for BNCT at THOR. *Applied Radiation and Isotopes*, 615, 1039–1043.
- Loong, C. K., Sollychin, R., Wong, R. K., Bradley, K., Piestrup, M. A., & Liang, T., 2014, The pros and cons of preliminary R&D of Boron Neutron Capture Therapy based on compact neutron generators: A plan of collaboration. *Physics Procedia*, 60, 264-270.

- Ma, C. W., Lv, C. J., Zhang, G. Q., Wang, H. W., & Zuo, J. X., 2015, Neutron-induced reactions on AlF_3 studied using the optical model. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 356, 42-45.
- Mansy, M. S., Bashter, I. I., El-mesiry, M. S., Habib, N., & Adib, M., 2015, Filtered epithermal quasi-monoenergetic neutron beams at research reactor facilities, *Applied Radiation and Isotopes*, 97, 78-83.
- Masoudi, S. F., Rasouli, F. S., & Ghasemi, M., 2017, BNCT of skin tumors using the high-energy DT neutrons. *Applied Radiation and Isotopes*, 122, 158-163
- Mirzaei, R. H., Sahebkar, A., Salehi, R., Nahand, J., 2017, Boron neutron capture therapy, *Journal of cancer Research and Therapeutics*, 12, 520-525.
- Mccall, J., 2005, Genetic algorithms for modelling and optimisation, *Journal of Computational and Applied Mathematics* 184, 205-222.
- Minsky, D. M., & Kreiner, A. J., 2014, Beam shaping assembly optimization for $^7\text{Li}, ^7\text{Be}$ accelerator based BNCT. *Applied Radiation and Isotopes*, 88, 233-237.
- Minsky, D. M., Kreiner, A. J., & Valda, A. A., 2011, AB-BNCT beam shaping assembly based on $^7\text{Li}(p,n)^7\text{Be}$ reaction optimization. *Applied Radiation and Isotopes*, 69(12), 1668-1671.
- Mitsumoto, T., Fujita, K., Ogasawara, T., Tsutsui, H., Yajima, S., & Industries, S. H., 2010, BNCT system using 30 MeV H-Cyclotron HM-30 Cyclotron, *Proceeding of cyclotron*, 6-8.
- Mokhtari, J., Faghihi, F., Khorsandi, J., & Hadad, K., 2017, Conceptual design study of the low power and LEU medical reactor for BNCT using in-tank fission converter to increase epithermal flux. *Progress in Nuclear Energy*, 95, 70-77.
- Monshizadeh, M., Kasesaz, Y., Khalafi, H., & Hamidi, S., 2015, MCNP design of thermal and epithermal neutron beam for BNCT at the Isfahan MNSR. *Progress in Nuclear Energy*, 83, 427-432.
- Morcos, H. N., & Naguib, K., 2012, Annals of Nuclear Energy QMENF-G: A computer package for quasi-mono-energetic neutron filters. *Annals of Nuclear Energy*, 401, 237-240.
- Morcos, H. N., & Naguib, K., 2014, Production of Optimal Epithermal Neutron Beams for BNCT, *Annals of Nuclear Energy* 40, 237-240.
- Moss, R. L., 2014, Critical review, with an optimistic outlook, on boron neutron capture therapy (BNCT). *Applied Radiation and Isotopes*, 88, 2-11.
- Nakamura, T., Horiguchi, H., Kishi, T., Motohashi, J., Sasajima, F., & Kumada, H., 2011, Resumption of JRR-4 and characteristics of neutron beam for BNCT. *Applied Radiation and Isotopes*, 69(12), 1932-1935.
- Nara, Y., Otuka, N., Ohnishi, A., Niita, K., & Chiba, S., 1999, Relativistic nuclear collisions at 1.0 A GeV energies from p+ Be to Au+ Au with the hadronic cascade model. *Physical Review C*, 61(2), 024901.
- Nedunchezian, K., Aswath, N., Thiruppathy, M., & Thirugnanamurthy, S., 2016, Boron neutron capture therapy-a literature review. *Journal of clinical and diagnostic research: JCDR*, 10(12), ZE01.

- Niita, K., Sato, T., Iwase, H., Nose, H., Nakashima, H., & Sihver, L., 2006, PHITS—a particle and heavy ion transport code system. *Radiation measurements*, 41(9-10), 1080-1090.
- Niita, K., Chiba, S., Maruyama, T., Maruyama, T., Takada, H., Fukahori, T., ... & Iwamoto, A., 1995, Analysis of the (N, xN) reactions by quantum molecular dynamics plus statistical decay model. *Physical Review C*, 52(5), 2620.
- Niita, K., Sato, T., Iwamoto, Y., Hashimoto, S., Ogawa, T., Furuta, T., Abe, S., Kai, T., Matsuda, N., Iwase, H., Nakashima, H., Fukahori, T., Okumura, K., Kai, T., Chiba, S., Sihver, L., 2015, *Particle and Heavy Ion Transport code System (PHITS)*, Japan Atomic Energy Agency, Jepang.
- Ono K., 2015. Experiment of BNCT by cur and star of clinical BNCT by small Cyclotron Based Neutron Generator in KURRI. *Proceding International symposium the application of nuclear Technology to support National Sustainable Development*. Solotiga.
- Osawa, Y., Imoto, S., Kusaka, S., Sato, F., 2017, Development of An Epithermal Neutron Field for Fundamental Researches for BNCT with A DT Neutron Source. *EPJ Web of Conferences*.153:04008.
- Pazirandeh, A., Torkamani, A., & Taheri, A., 2011, Design and simulation of a neutron source based on an electron linear accelerator for BNCT of skin melanoma. *Applied Radiation and Isotopes*, 695, 749–755.
- Pelowitz, D. B., 2008, *RSICC computer code collection MCNPX 2.7.0*, New Mexico: Los Alamos National Library.
- Podgorsak, B. E., 2010, *Biological and Medical Physics*, *Biomedical Engineering* 2nd ed.. London: Springer VBH.
- Rahmani, F., & Shahriari, M., 2011, Beam shaping assembly optimization of Linac based BNCT and in-phantom depth dose distribution analysis of brain tumors for verification of a beam model. *Annals of Nuclear Energy*, 38(2-3), 404-409.
- Ramadan, M., & Alay, E. A., 2015, Boron delivery agen used in boron neutron capture therapy for cancer treatment, *IJPRBS*, 4(2), 14-39.
- Rasouli, F. S., & Masoudi, S. F., 2012, Design and optimization of a beam shaping assembly for BNCT based on D–T neutron generator and dose evaluation using a simulated head phantom. *Applied Radiation and Isotopes*, 70(12), 2755–2762.
- Rasouli, F. S., Masoudi, S. F., & Kasesaz, Y. 2012. Design of a model for BSA to meet free beam parameters for BNCT based on multiplier system for D–T neutron source. *Annals of Nuclear Energy*, 39(1), 18-25.
- Rasouli, F. S., & Masoudi, S. F., 2012, Simulation of the BNCT of brain tumors using MCNP Code: Beam Designing and Dose Evaluation, *Applied Radiation and Isotopes*, 93, 183–192.
- Rasouli, F. S., & Masoudi, S. F., 2014, A study on the optimum fast neutron flux for Boron Neutron Capture Therapy of deep-seated tumors, *Applied Radiation and Isotopes*. 11, 1-22.
- Rocha, I. B. C. M., Parente Jr, E., & Melo, A. M. C., 2014, A hybrid shared/distributed memory parallel genetic algorithm for optimization of laminate composites, *Composite structures*, 107, 288-297.

- Rogers, J. D., 2013, The neutron's discovery - 80 years on. *Physics Procedia*, 43, 1–9.
- Rorer, D.A., Wambersie, G., Whitmore, R., Zamenhof, V., Levin, P., Andreo , dan Dodd, B., 2001, *Current Status of Neutron Capture Therapy*, A technical document, IAEA-TECDOC-1223, International Atomic Energy Agency, Vienna.
- Shaaban, I., Albarhoum, M., 2015, Design calculation of an epithermal neutronic beam for BNCT at the Syrian MNSR using the MCNP4C code. *Progress in Nuclear Energy*, 78: 297–302.
- Sadoughi, R. H., Nasserri, S., Momennezhad, M., 2014, A Comparison between GETE and MCNPX Monte Carlo Code in simulation of medical linier accelerator, *J Med Signal* , 4(1), 10-17.
- Safronov, V. A., 2014, Boron neutron capture therapy of cancer as a part of modern nanomedicine, *International Journal of Medical Nano Research*, 1-2.
- Sakurai, Y., 2017, *Reactor-based Facility For BNCT*. KURRI-BNCT-International training course for Indonesia.
- Sakurai, Y., Tanaka, H., Takata, T., Fujimoto, N., Suzuki, M., Masunaga, S., & Watanabe, T., 2015, Advances in boron neutron capture therapy (BNCT) at kyoto university-From reactor-based BNCT to accelerator-based BNCT. *Journal of the Korean Physical Society*, 67(1), 76-81.
- Salehi, D., Sardari, D., & Jozani, M. S., 2013, Characteristics of a heavy water photoneutron source in boron neutron capture therapy. *Chinese Physics C*, 37(7), 078201.
- Santos, A., de Andrade e Silva, G. A., Mura, F.L., Fuga, R., Jeez, R., and Mendon, G. A., 2013, Tree heavy reflector experiment in the IPEN/MB-01 reactor: stainless steel, carbon steel and nikel, *Nuclear Data sheets* 118, 568-570.
- Sato, T., Niita, K., Matsuda, N., Hashimoto, S., Iwamoto, Y., Noda, S. 2013, Particle and Heavy Ion Transport code System, PHITS, version 2.52. *J. Nucl. Sci. Technol*, 50(9): 913-923.
- Sato Y, Takizawa F, Hiraga Y, Kyanagi. 2013. Neutron Slowing down Efficiency Depending on Proton Energy for Accelerator based BNCT. *Physics Procedia*. 60: 15-22.
- Sato, T., Iwamoto, Y., Hashimoto, S., Ogawa, T., Furuta, T., Abe, S. I., & Shigyo, N., 2018, Features of particle and heavy ion transport code system (PHITS) version 3.02. *Journal of Nuclear Science and Technology*, 55(6), 684-690.
- Sato, K., Uritani, A., Watanabe, K., Yoshihashi, S., Yamazaki, A., Kiyangi, Y., & Tsuchida, K., 2018, Improved Design of the Exit of a Beam Shaping Assembly for an Accelerator-driven BNCT System in Nagoya University. In *Proceedings of the International Conference on Neutron Optics (NOP2017)* (p. 011003).
- Sauerwein, W. A. G., & Moss, R. L., 2009, *Requirements for boron neutron capture therapy (BNCT)at a nuclear research reactor*. Springer Heidelberg, New York.

- Savolainen, S., Kortensniemi, M., Timonen, M., Reijonen, V., Kuusela, L., Uusi-Simola, J., ... Auterinen, I., 2013, Boron neutron capture therapy BNCT in Finland: Technological and physical prospects after 20 years of experiences. *Physica Medica*, 293, 233–248.
- Sawada, Y., Uozumi, Y., Nogamine, S., Yamada, T., Iwamoto, Y., Sato, T., & Niita, K., 2012, Intranuclear cascade with emission of light fragment code implemented in the transport code system PHITS. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 291, 38-44.
- Sears, F. V., 1992, Neutron Scattering length and cross section, *Neutron News*, 3, 1-37.
- Shaaban, I., & Albarhoum, M., 2014, Design calculation of an epithermal neutronic beam for BNCT at the Syrian MNSR using the MCNP4C code. *Progress in Nuclear Energy*, 78, 297–302.
- Shin, J. W., & Park, T. S., 2015, New charge exchange model of GEANT4 for ${}^9\text{Be}(p, n){}^9\text{B}$ reaction. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 342, 194-199.
- Suyanto, 2007, Artificial Intelligene, Informatika, Bandung.
- Shibata, K., Iwamoto, O., Nakagawa, T., Iwamoto, N., Ichihara, A., Kunieda, S., & Murata, T., 2011, JENDL-4.0: a new library for nuclear science and engineering. *Journal of Nuclear Science and Technology*, 48(1), 1-30.
- Sihver, L., Sato, T., Gustafsson, K., Mancusi, D., Iwase, H., Niita, K., & Matsuda, N., 2010, An update about recent developments of the PHITS code. *Advances in Space Research*, 45(7), 892-899.
- Soppera, N., Bossant, M., Cabellos, O., Dupont, E., & Díez, C. J., 2017, JANIS: NEA JAva-based Nuclear Data Information System. In *EPJ Web of Conferences* (Vol. 146, p. 07006). EDP Sciences.
- Stefanik, M., Bem, P., Majerle, M., Novak, J., Simeckova, E., & Stursa, J., 2019, Neutron field study of p (35)+ Be source reaction at the NPI Rez. *Radiation Physics and Chemistry*, 155, 294-298.
- Shultis, J. K., & Faw, R. E., 2011, *An MCNP primer*, Kansas State UniversityManhattan, KS 66506, 1-42).
- Takada, K., Sato, T., Kumada, H., Koketsu, J., Takei, H., Sakurai, H., & Sakae, T., 2017, Validation of the physical and RBE-weighted dose estimator based on PHITS coupled with a microdosimetric kinetic model for proton therapy. *Journal of radiation research*, 59(1), 91-99.
- Takata, T., Tanaka, H., Sakurai, Y., Maruhashi, A., 2010, Increase in irradiation beam intensity by using a hybrid target system in cyclotron-based neutron capture therapy. *Journal of Nuclear Science and Technology*, 47(7), 575–581.
- Tanaka, H., Sakurai, Y., Suzuki, M., Masunaga, S., Kinashi, Y., Kashino, G., Ono, K., 2009, Characteristics comparison between a cyclotron-based neutron source and KUR-HWNIF for boron neutron capture therapy. *Nuclear Instruments and Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms*, 267(11), 1970–1977.
- Tanaka, H., Sakurai, Y., Suzuki, M., Masunaga, S., Mitsumoto, T., Fujita, K.,

- Maruhashi, A., 2011, Experimental verification of beam characteristics for cyclotron-based epithermal neutron source C-BENS. *Applied Radiation and Isotopes*, 69(12), 1642–1645.
- Torabi, F., & Masoudi, S. F., 2014, BSA optimization and dosimetric assessment for an electron linac based BNCT of deep-seated brain tumors. *J Radioanal Nucl. Chem*, 300:1167–1174.
- Tsoufanidis, N., 1995, *Detection of radiation*. University of Missouri-Rolla Taylor.
- Tsukamoto, T., Tanaka, H., Yoshinaga, H., Mitsumoto T., Maruhashi, A., Ono, K., 2011, A phantom experiment for the evaluation of whole body exposure during BNCT using cyclotron-based epithermal neutron source (C-BENS), *Applied Radiation and Isotopes*, 69(12): 1830–1833.
- Turkmen, M., Ergun, S., Colak, U., 2017, A New Method in beam shaping: multi-objective genetic algorithm method coupled with a monte carlo based reactor physics code. *Progress in Nuclear Energy*, 99, 165-176.
- Verbeke, J. M., Chen, A., Vujic, J., & Leung, K. N., 1997, Optimization of beam-shaping assemblies for BNCT using the high energy neutron sources. *Nuclear Engineering Department University of California, Berkeley*.
- Vujic, J. L., Waldron, W. L., Kim, L., Chivers, D., Kastenber, W. E., Leung, K. N., & Guess, S., 2003, *Optimal Neutron Source and Beam Shaping Assembly for Boron Neutron Capture Therapy* (No. DOE-ID-13642).
- Widiharto, A., 2014, Metode monte carlo dan aplikasinya dalam perhitungan radiasi nuklir pada BNCT boron neutron capture cancer therapy, *Proceeding Development of Technology and Application of Boron Neutron Capture Cancer Therapy Based on Particle Accelerator Technology*, Bali.
- Widodo, S., Sardjono, Y., 2018, *Manufaktur dan standarisasi komponen kolimator dan obat berbasis boron neutron capture terapi (BNCT)*. Pusat Sains dan Teknologi Akselerator Badan Tenaga Nuklir Nasional Yogyakarta.
- Wu, Y., Ji, Q., Kwan, J., Leung, K-N., 2008, *Recent developments of compact neutron generators at LBNL*, Lawrence Berkeley National Laboratory.
- Yanch, J. C., Zhou, X. L., Shefer, R. E., & Klinkowstein, R. E., 1992, Accelerator-based epithermal neutron beam design for neutron capture therapy, *Phys. Med. Biol.*, 9(13), 709-721.
- Yang, Z. Y., Tsai, P. E., Lee, S. C., Liu, Y. C., Chen, C. C., Sato, T., & Sheu, R. J., 2017, Inter-comparison of dose distributions calculated by FLUKA, GEANT4, MCNP, and PHITS for proton therapy, In *EPJ Web of Conferences*, 153, 04011. EDP Sciences.
- Yu Q., 2016, Energy deposition calculated by PHITS code in Pb spallation target, *Nuclear Instruments and Methods in Physics Research B* 367, 8–13.
- Yura, Y., & Fujita, Y., 2013, Boron neutron capture therapy as a novel modality of radiotherapy for oral cancer: principle and antitumor effect, *Oral Science International*, 10, 9-14.
- Zaidi, L., Kashaeva, L., Lezhnin, Samarin, Sycheva, Taskae, 2017, Neutron-beam-shaping assembly for boron neutron-capture therapy, *Physics of Atomic Nuclei*, 801, 60–66.