KYOTO FUSIONEERING

Prof. Keishi Sakamoto

Director, Chief Technical Officer and Co-Head of Technical Development Department

Prof. Keishi Sakamoto joined Kyoto Fusioneering in 2021, now serves as its CTO and initiates research and development of its gyrotron systems utilized for plasma heating to achieve commercialization of fusion energy.

With over 3 decades in academics and R&D of fusion engineering, he contributes to harness plasma heating and radio frequency technologies that Japanese national laboratories and manufacturers have developed.

1979	BS, Kyushu University
1981	MS, Kyushu University
1981-2003	Researcher of RF Heating Technology group, Japan Atomic Energy Research Institute
1993	Ph.D., Kyushu University
2004-2015	Head of RF Heating Technology group, Japan Atomic Energy Agency
2006-2008	Guest Professor of National Institute of Fusion Science
2006-2021	Guest Professor of University of Tsukuba
2011-2013	Guest Professor of University of Fukui
2016-2021	Director of Fusion Reactor Material Division and Project Manager of the IFMIF/EVEDA Project, National Institutes for Quantum Science and Technology (QST)
2021	Specially appointed Professor of Kyoto University

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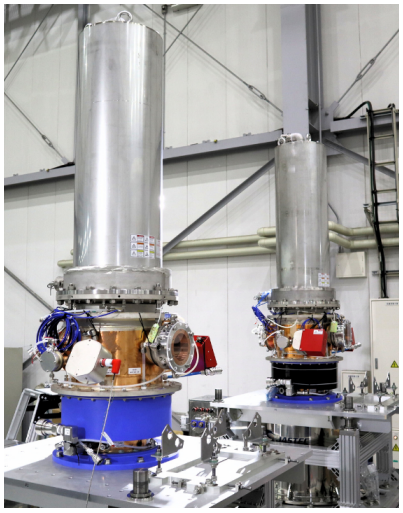
Key Scientific Expertise

- Research and development of RF heating systems with a focus on high power gyrotron
- Leadership of large research groups at QST.
- Project management with extensive experience in:
  - Gyrotron research and development activities at Kyoto Fusioneering
  - The IFMIF/EVEDA project at QST
- Extensive teaching experience as a professor at:
  - University of Tsukuba (2006-2021)
  - National Institute of Fusion Science (2006-2008)
  - University of Fukui (2011-2013)
  - Kyoto University (2021)



Fusion Development Contribution

Prof. Keishi Sakamoto joined Kyoto Fusioneering in April 2021 as an Executive Officer. He has been engaged in R&D for plasma heating technology for several decades, most recently at QST in Japan.
In particular, he has been extensively involved in the development of gyrotrons, high-power millimeter-wave generators based on the theory of relativity. As a result, he was the first in the world to simultaneously achieve an output energy of 1 MW an energy conversion efficiency of more than 50%, with continuous output.

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Publications

- Y. Ishii, N. Aiba, M. Ando, M. Yagi, K. Sakamoto, et al., “R&D Activities for Fusion DEMO in the QST Rokkasho Fusion Institute”, Fusion Science and Technology, 77(2):1-17, (2021), DOI: 10.1080/15361055.2021.1925030
- R.Ikeda, Y.Oda, T.Kobayashi, K.Kajiwara, M.Terakado, K.Takahashi, S.Moriyama, K.Sakamoto, Multi-frequency, MW-power triode gyrotron having a uniform directional beam, Journal of Infrared, Millimeter, and Terahertz Waves, Volume 38, pages 531–537, (2017)
- K.Sakamoto, et al., Progress of high power 170 GHz gyrotron in JAEA, Nuclear Fusion, 49(9), 095019 (2009), DOI: 10.1088/0029-5515/49/9/095019
- K.Sakamoto, A.Kasugai, K.Takahashi, et al. Achievement of robust high-efficiency 1 MW oscillation in the hard-self-excitation region by a 170 GHz continuous-wave gyrotron. Nature Phys 3, 411–414 (2007). DOI: 10.1038/nphys599
- K.Sakamoto, A.Kasugai, Y.Ikeda, et al., Development of 170GHz and 110GHz gyrotrons for fusion devices, Nucl.Fusion, 43, p729 (2003).
- K.Sakamoto, et al., High power 170 GHz gyrotron with synthetic diamond window, Review of Scientific Instruments, 70, 208-212 (1999), https://doi.org/10.1063/1.1149567
- K.Sakamoto, A.Kasugai, M.Tsuneoka, K.Takahashi, et al., Stable, Single mode oscillation with high ordervolume mode at 1MW, 170GHz, gyrotron J.Physical Society of Japan, 1888-1890 (1996).
- K.Sakamoto, et al., Major improvement of gyrotron efficiency with beam energy recovery. Physical Review Letters, 73, 3532-3535, (1994). DOI: https://doi.org/10.1103/PhysRevLett.73.3532
- K.Sakamoto, et al., Beam divergence with harmonic gyroresonance in focusing wiggler and axial field, Physical Review Letters, 70, 441-444 (1993). DOI: https://doi.org/10.1103/PhysRevLett.70.441