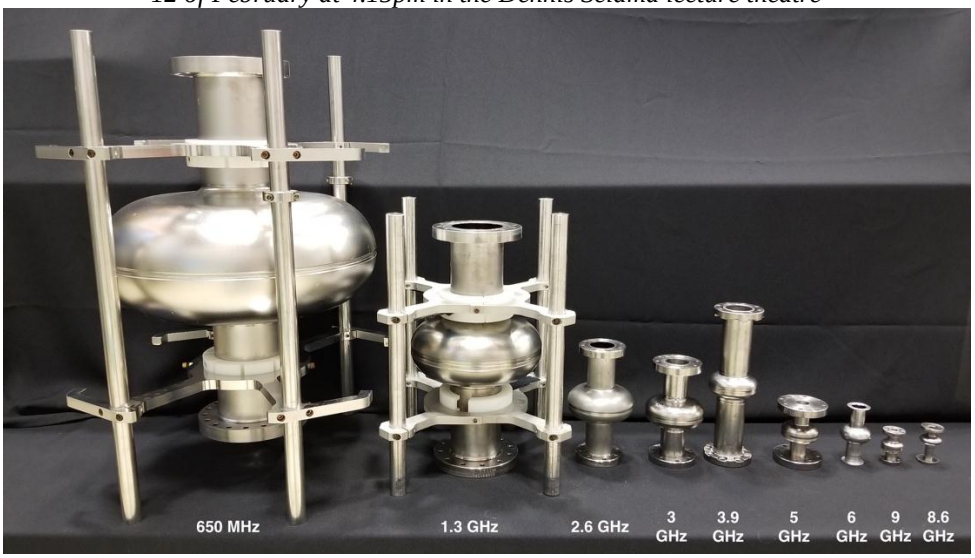
Radio frequency superconductivity for particle accelerators: *Recent trends in physics and technology*

Sergey Belomestnykh

12 of February at 4.15pm in the Dennis Sciama lecture theatre



Abstract

Over the past several years, the field of radio frequency superconductivity (SRF) for particle accelerators is going through a period of Renaissance. 4-5 years ago, most of the community thought that the technology reached maturity (even though we lacked understanding of some basic physics) and one can achieve only incremental gains in the niobium cavity performance. The field tended to be mostly technological with only few researchers trying to study fundamental issues of SRF in niobium. Big improvement steps were thought to be possible only with developing alternative materials (e.g. Nb_3Sn). Recent discoveries of nitrogen doping and infusion, magnetic flux expulsion, opened new horizons and revived interest to studies of SRF basics, both experimental and theoretical. More unexpected and intriguing results have been obtained. In this talk I will try to shed light upon some exciting recent results, show new trends and hopefully inspire young generation to turn their attention to this field of research.

Sergey Belomestnykh is the Chief Technology Officer (CTO) at Fermilab, Batavia, Illinois. As CTO, he provides leadership in planning, directing and overseeing the activities of the Technical Division, which employs about 270 scientists, engineers and technicians, and provides the lab's technological and technical vision moving forward. Technical Division pursues highly innovative R&D program in superconducting radio frequency cavities and magnets for particle accelerators, develops and builds modern accelerators using cutting-edge technologies, educates and trains the next generation of physicists and engineers. He joined Fermilab in 2015. Prior to that he worked at Brookhaven National Laboratory, Cornell University and the Budker Institute of Nuclear Physics, developing radio frequency and superconducting radio frequency systems for various particle accelerators. Sergey received his Ph.D. from Budker Institute of Nuclear Physics, is a fellow on the American Physical Society and received the 2015 IEEE Particle Accelerator Science and Technology Award for his achievements in the science and technology of RF and SRF for particle accelerators.

The Seminar will be broadcasted on the WebEx, and the connection information will be posted on the web site http://www.adams-institute.ac.uk/lectures