NAPAC2025 - North American Particle Accelerator Conference

Sunday 10 August 2025 - Friday 15 August 2025

SAFE Credit Union Convention Center

Classifications

MC1 - Colliders and other Particle and Nuclear Physics Accelerators

MC1 covers accelerators (e.g., synchrotrons , linacs , ERLs) and storage rings providing colliding beams of hadrons or leptons for particle and nuclear physics, including the associated Machine Detector Interface (MDI) region. This includes operating experience and performance limitations, upgrade plans, accelerator physics and technology issues specific to colliders and the design and R&D for future projects. MC1 also includes accelerator- based fixed target machines, as discussed in “Beyond Colliders” or similar efforts in Particle and Nuclear Physics.

MC2 - Photon Sources and Electron Accelerators

MC2 covers photon sources (synchrotron light sources, ERLs, FELs, laser systems, other free electron sources such as THz sources, Compton sources, etc.) and electron accelerators (linear, circular, recirculating, etc.). It includes insertion devices such as planar and helical field undulators. Associated accelerator systems, such as injectors, booster synchrotrons, photon beam lines and photon beam line components can also be proposed for this Session classification. Papers presented can be project descriptions or cover individual aspects of photon sources and electron accelerators. Both theoretical and experimental results are solicited.

MC3 - Novel Particle Sources, Acceleration Techniques, and their Applications

MC3 covers (i) novel and unconventional sources of particles, including electrons and protons, neutrons, ions, and secondary particles and antiparticles; and (ii) new concepts of accelerating techniques which may overcome the present limitations of size and/or cost or which give access to very new beam characteristics (e.g., plasma accelerators, ultra high gradient vacuum accelerators). Novel here refers to technologies or parameters that are not yet widely used in operation.

MC4 – Hadron Accelerators

MC4 covers design, development, construction, commissioning, operation and upgrades of low, medium and high energy hadron accelerators, excluding hadron colliders. This includes ion sources, electrostatic accelerators, proton and ion linear accelerators, proton and ion synchrotrons, radioactive beam facilities, antiproton accumulators and collectors, ion accumulators and storage rings, cyclotrons, synchrocyclotrons, FFAs and any other similar machines. Both low and high intensity machines are covered, as are all relevant aspects of high intensity fixed target accelerators such as proton or light ions drivers for neutron sources, neutrino factories, etc.

MC5 – Beam Dynamics and EM Fields

MC5 covers general aspects of electro magnetic interactions of charged particle beams in accelerators and storage rings. This includes linear and nonlinear beam optics, modeling of externally applied or beam generated electro magnetic fields, as well as theory, observations and simulations of single particle dynamics and collective effects, both coherent and incoherent. The

emphasis is on deepening the understanding of fundamental processes or limitations governing beam dynamics and uncovering possible new mechanisms relevant to accelerator design and performance, independent of technological or project specific aspects.

MC6 - Beam Instrumentation, Controls, AI/ML, and Operational Aspects

MC6 covers measurement and control of the beam properties in particle accelerators including beam diagnostics and instrumentation, beam feedback systems, low level rf controls, timing and synchronization schemes and laser-based instrumentation for all types of accelerators. Included also are contributions to accelerator control systems, online modeling and applications control software, as well as operational aspects of modern accelerators such as alignment and surveying methods, machine protection systems, radiation protection and monitoring, issues pertaining to reliability and operability, and applicable Machine Learning solutions.

MC7 – Accelerator Technology and Sustainability

MC7 covers design, construction, testing and performance of accelerator components or subsystems, with emphasis on technological aspects and methods. It includes radio frequency cavities and systems, magnets, vacuum, cryogenics, power supplies, collimators, and targets, dumps, timing, lasers, and other accelerator components and subsystems. Advanced technologies for accelerator component manufacturing and technology specific sustainability are included. Contributions with emphasis on achieving beam performance specific to an accelerator type or design should generally be classified elsewhere.

MC8 – Applications of Accelerators, Technology Transfer, Industrial Relations, and Outreach

MC8 includes contributions with emphasis on the broad applications of accelerators, the development of accelerator technologies for specific applications, aspects of technology transfer and laboratory industry relationships. This MC also includes Outreach and Communication for broad scientific dissemination, utilization of test facilities for radiation exposure, as well as industrially focused sustainability advances.