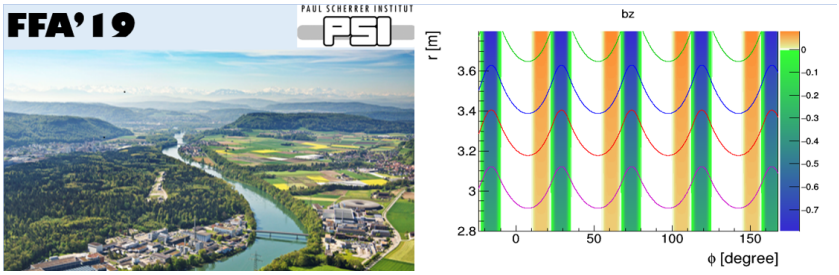

Contribution ID: **18** Type: **not specified**

A 15-20 MeV/nucleon iso-FFA for Radioisotope Production*

Wednesday 20 November 2019 11:00 (45 minutes)

A compact, isochronous fixed-field, gradient ion accelerator, ˜1.5 meters in radius, is under design utilizing high-gradient cavities in order to accelerate multi-ion species up to 15-20 MeV/u with large turn-to turn, centimeter-level separation for low-loss extraction without the need for lossy foil stripping. A strong-focusing radial field profile is optimized in a separated-sector format establishing control over machine tune simultaneously imposing isochronous orbit requirements to promote high-current (˜0.5 milliamp) operation. Innovation in injection will be introduced to replace the high-loss central region; either an ion RFQ or a solid-state tandem. Designing for a charge to mass of ½ is proposed to allow either protons in the form of H2+ and light ions (up to Ca) to be accelerated and delivered using the same system. The high-current machine under design is ideal for producing radioisotopes with numerous applications in medicine, biology, physics, chemistry, agriculture, include national security and environmental and materials science. Further, the use of separated sectors allows extraction or insertion of targets at optimal energies for isotope production. With multi-ion capability (H2+ and He2+) both 211At and 225Ac can be mass produced. Additionally, an intense neutron beam can be generated using a high current of protons on a Be target for production of Moly-99; a reaction which requires less energy per secondary neutron than a current approach using a DT source.

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