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CryoMPET: the Cryogenic Upgrade to TITAN's Mass Measurement Penning Trap ERICH LEISTENSCHNEIDER, University of British Columbia, TITAN COLLABORATION — Atomic masses are key tools to understand the nature of nuclear forces. With the availability of beams of very exotic species, mass spectroscopy techniques have become more challenging. They need to be faster, more efficient, and still have to provide high enough precision to be of scientific value. The TITAN facility at TRIUMF has been performing precision mass measurements of radioactive nuclei for almost a decade. Its main equipment, the Measurement Penning Trap (MPET), employs the Time-of-Flight Ion Cyclotron Resonance technique to probe atomic masses of ions living as short as 10ms. A powerful way to increase the precision of such technique is to charge-breed the inspected ion, which, in order to prevent charge state decay through a typical measurement cycle, requires trap's vacuum level to be in the order of 1E-11 Torr. Otherwise, the ion's charge state will most likely decay via electron recapture from the trap's background gas. MPET is being redesigned to perform mass measurements of ions at charge states over +20. It will be integrated into a new cryogenic vacuum system and should be ready for commissioning in 2017. We will present the details of TITAN's new CryoMPET upgrade including its design concept and the status of its development.

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