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Addressing the systematics in phase-imaging ion-cyclotron-resonance measurements at the Canadian Penning Trap mass spectrometer

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Phase-imaging ion-cyclotron-resonance (PI-ICR) is a novel technique for determining the cyclotron frequency (ν_c) of an ion trapped in a Penning trap. First developed by the SHIPTRAP group at GSI [1], this technique relies on measuring the radial phase a trapped ion accumulates over a period of time. At the Canadian Penning Trap mass spectrometer (CPT) in Argonne National Laboratory (ANL), PI-ICR is currently employed [2,3]. The measurement campaigns and extensive tests over the last few years have revealed a number of systematics relating to the alignment between the magnetic field and ejection optics, the stability of the Penning trap electric field, and the initial magnetron motion of the ions [4]. These systematics and the efforts to address them will be presented.

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