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The High-Resolution Medium-Energy Chopper Spectrometer (HRMECS): Instrumentation Upgrade and Future Scientific Opportunities

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HRMECS is a first-generation pulsed-source chopper spectrometer designed and built at IPNS during the 1980's. It features a 4-m sample-to-detector flight path with detectors covering scattering angles from -20° to 140°, quite similar to the design of MARI which is a third-generation chopper spectrometer at ISIS. However, apart from having a much lower flux level than MARI has at ISIS, HRMECS has three major drawbacks: i) it has detectors covering only ~40% of the slots; ii) at low scattering angles there is no position-sensitive detectors to provide good Q-resolution; and iii) the Fermi choppers which employ mechanical bearings cannot be rotated at angular speeds exceeding 270 Hz thereby providing limited energy-resolution ($\Delta E/E_0$ ~2-4%).

Over the years, incremental improvements have been made to enhance the capabilities of HRMECS. Recently, HRMECS undergoes an extensive upgrade that addresses the above problems. Since the process is currently underway, we refer the reader to the HRMECS Web Site at http://www.pns.anl.gov/HRMECS/HRMECS_frameset.html where detailed, updated information can be found.