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COLDDIAG: a cold vacuum chamber for diagnostics

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One of the still open issues for the development of superconducting insertion devices is the understanding of the heat load induced by the beam passage. With the aim of measuring the beam heat load to a cold bore and in order to gain a deeper understanding in the beam heat load mechanisms, a cold vacuum chamber for diagnostics is under construction. We plan to have access with the same set-up to a number of different diagnostics, so we are implementing: i) retarding field analyzers to measure the electron flux, ii) temperature sensors to measure the total heat load, iii) pressure gauges, iv) and mass spectrometers to measure the gas content. The inner vacuum chamber will be removable in order to test different geometries and materials. COLDDIAG is built to fit in a short straight section at ANKA, but we are proposing its installation in different synchrotron light sources with different energies and beam characteristics. A first installation in DIAMOND is planned in June 2011. Here we describe the technical design report of this device and the planned measurements with beam.

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