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Design of a triple-cooling assembly for high purity germanium detectors for Coincidence Doppler Broadening Spectroscopy

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Coincidence Doppler Broadening Spectroscopy requires the use of high purity Germanium detectors cooled to approximately 100K as these possess an excellent energy resolution for the analysis of the positron-electron annihilation radiation. To increase the overall detection efficiency the available solid angle should be covered by as many detectors as possible. Conventional cooling with large dewars, as in the current setup, would limit the total number of detectors, and filling many of them with liquid nitrogen would be impractical. For this reason, a novel approach was pursued in which multiple dewars are replaced by a pivoting, flexible cooling rod arrangement for three detectors connected to a cryo-cooler. In this contribution, the design and first tests will be presented.

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