

Beam Time Request

from the combined approved experiments from the JEDI Collaboration:

E007: Further Exploration of Spin Dynamics Issues for EDM Search

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and

E008: Axion-EDM: An Axion Search at COSY

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At the eighth CBAC meeting, the committee heard two requests, one for E007 (various spin dynamics and polarimeter target tasks) and another for E008 (axion search). Experiment E007 addresses three issues surrounding electron cooling, polarimeter targets, and spin anomalies that have appeared at higher beam intensities; experiment E008 demonstrates the capability to search for axion-like particles through a resonance with an oscillating electric dipole moment. Both were approved. No new time was awarded for the axion search. It was recommended that this effort be combined with E007. In both cases the original request was for two weeks of running following one week of machine development. The published schedule for 2019 contains only one of these three-week running periods. It is supposed to serve the needs of both experiments together. This seems to be the result of an incorrect understanding that somehow these experiments could operate at the same time once beam setup was completed.

The idea started with the observation that both experiments make use of the horizontally-polarized deuteron beam prepared so that the polarization lifetime is long, approaching 1000 s. In the past this preparation has typically taken about 10 days. But after that, the two experiments plan to do very different things. This beam time request is for the additional time needed during the 2019 run to make significant progress with the demonstration of the axion search method (first priority) followed by an exploration of whether electron cooling is required for long in-plane polarization lifetimes (second priority) and a study of the anomalous polarization behavior that seems to be associated with running at

higher beam intensities (third priority). For now, the third part of E007 will be postponed since we have not been able to identify a suitable configuration for the strip target tests. By keeping these parts of E007 and E008 adjacent in the same beam time, we still gain the advantage of not having to repeat the preparation of the in-plane polarization with a long polarization lifetime.

The beam time request is:

Beam time request: 42 shifts of running time