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Project 8, Phase III Design: Placing an eV-Scale Limit on the Neutrino Mass using Cyclotron Radiation Emission Spectroscopy[1] NOAH OBLATH, Pacific Northwest National Laboratory, PROJECT 8 COLLABORATION — We report on the design concept for Phase III of the Project 8 experiment. In the third phase of Project 8 we aim to place a limit on the neutrino mass that is similar to the current limits set by tritium beta-decay experiments, $m_\nu < 2\,\mathrm{eV}$. From the first two phases of Project 8 we move to a novel design consisting of a $\sim 100\,\mathrm{cm}^3$ cylindrical volume of tritium gas instrumented with two 30-element rings of inward-facing antennas. Beam-forming techniques similar to those used in radioastronomy will be employed to search for and track electron signals in the fiducial volume. This talk will present the quantitative design concept for the phased-array receiver, and illustrate how we are progressing towards the Phase IV experiment, which will have sensitivity to the neutrino mass scale allowed by the inverted mass hierarchy.

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Noah Oblath
Pacific Northwest National Laboratory

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