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The AMoRE-II Cryostat

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The advanced Mo-based rare process experiment (AMoRE) is an international project to search for neutrinoless double beta decay (0νββ) of 100Mo using a large-scale low temperature detector. The project employs scintillating molybdate crystals for high-resolution detection of phonon and scintillation signals with MMC readouts at mK temperatures. AMoRE-II, the second phase of the project, is currently being prepared and will readout/operate 200 kg of molybdate crystals comprised of enriched 100Mo double-beta decaying isotopes. We report on the design and fabrication status of the AMoRE-II cryostat. The mass of the detector tower containing the crystals, copper frame, and lead and copper shields is about 3 ton. The detector tower has a mechanically soft thermal connection to the 1-m diameter mixing chamber plate of the cryostat, and has its own mechanical support system from outside of the cryostat. The system includes a dilution refrigerator, three pulse tube refrigerators, and a precooling unit for the detector tower. We will discuss the details of the refrigeration units, the vibration cares and the shield system of the AMoRE-II cryostat.

Less than 5 years of experience since completion of Ph.D

N

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N

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