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In-medium spectral change of vector mesons explored via dielectron decay at J-PARC

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J-PARC E16 experiment aims to measure the spectral change of vector
mesons in a nuclear medium. It measures dielectron invariant mass spectra in p+A collisions at 30 GeV. The invariant mass is a mixture of the mass of vector mesons that decay inside and outside of the nuclear medium. Therefore, it is sensitive to the in-medium mass of vector mesons. We give emphasis on phi meson due to its narrow and isolated peak. According to QCD sum rule calculations, the mass is sensitive to the strange quark condensate in the medium.
We have conducted several commissioning runs while increasing the
acceptance, upgrading detectors and DAQ. The last one accepted 206 hours of primary proton beam in total, intermittently conducted in April-June 2024.
We were able to demonstrate excellent electron identification capability
using Hadron Blind Detector (HBD) and Leadglass (LG) calorimeters,
together with four layers of tracking devices, one layer of silicon
detectors (SSD) and three layers of Gas Electron Multiplier (GEM)
Trackers. Omega and phi mesons were observed. In this talk, we report
the outcomes of the commissioning runs and the prospects for the physics run.

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