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Preliminary Results from the AlCap Experiment

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Observation of neutrinoless muon-to-electron conversion in the presence of a nucleus would be unambiguous evidence of physics Beyond the Standard Model. Two experiments, COMET at J-PARC and Mu2e at Fermilab, will search for this process in the coming decade. Barring discovery, these experiments will provide upper-limits on this branching ratio up to 10,000 times better than previously published.

COMET/Mu2e developed a joint venture, the AlCap Experiment, to measure particle emission spectra from muonic interactions in a number of materials. As a significant background process in COMET/Mu2e, AlCap sought to measure the charged particle and neutron spectra following nuclear capture on the candidate target materials aluminum and titanium. Additionally, COMET/Mu2e are exploring normalization schemes via AlCap's measurement of the photon spectra following both atomic and nuclear capture.

Over the course of 2013 and 2015, AlCap performed three runs at the Paul Scherrer Institut in Switzerland. Preliminary results are presented and compared across all runs.

Primary author: Mr QUIRK, John (Boston University)

Co-author: ALCAP COLLABORATION, Paul Scherrer Institut (PSI)

Presenter: Mr QUIRK, John (Boston University)

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