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Results and prospects from the PIENU experiment

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The PIENU experiment at TRIUMF aims to measure the branching ratio, $R_{e/\mu} = \Gamma(\pi^+ \rightarrow e^+ \nu_e \gamma) / \Gamma(\pi^+ \rightarrow \mu^+ \nu_\mu \gamma)$, with 0.1% precision providing the most precise test of the lepton universality. The collaboration collected physics data during 2009–2012, and the result of $R_{e/\mu}$ based on part of the 2010 data was published in 2015. The analysis of the full data set (10^7 of $\pi^+ \rightarrow e^+ \nu_e \gamma$ decays) with 0.1%

The search for heavy neutrinos in $\pi^+ \rightarrow e^+ \nu_e \nu$ and $\pi^+ \rightarrow \mu^+ \nu_\mu \nu$ decays were also performed using the high statistics pion-decay data we had accumulated. The results were published in 2018 for $\pi^+ \rightarrow e^+ \nu_e \nu$ and accepted-for-publication for $\pi^+ \rightarrow \mu^+ \nu_\mu \nu$.

The result of the heavy neutrinos search and the updated status of the $R_{e/\mu}$ analysis with the full data set will be presented.

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