TOTAL ABSORPTION SPECTROSCOPY AND ITS INFLUENCE ON DECAY HEAT AND PREDICTED REACTOR ANTINEUTRINO FLUXES

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Total absorption spectroscopy is a technique that helps to obtain true β-feeding patterns in complex decays. In addition to influencing nuclear structure models and understanding of decay heat from nuclear reactors[1], the need for improved measurements of β-feeding patterns from fission decay products has come to the forefront of precision reactor antineutrino experiments. Recent precision direct antineutrino measurements by the RENO, Daya Bay, and Double Chooz collaborations have found an overall deficit when compared to the predicted antineutrino flux from nuclear reactors and an excess in the antineutrino flux from the reactors around 5 to 7 MeV when compared with the predicted antineutrino energy spectrum. These are called the „reactor antineutrino anomaly" and the „reactor antineutrino shoulder", respectively. We have performed total absorption measurements of over 70 fission products including 20 high priority fission products, many of which are top contributors to the „reactor antineutrino anomaly" and „shoulder", using the Modular Total Absorption Spectrometer (MTAS) at Oak Ridge National Laboratory. We will present results from several of these high priority measurements and discuss their influence on decay heat, the „reactor antineutrino anomaly", and the „reactor antineutrino shoulder".

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