博士論文公聴会の公示(物理学専攻)

学位申請者:Wei Min CHAN

論文題目: Study of 180mTa Decay and Development of Ultra-low Background Gamma-ray Spectrometry (180m Taの崩壊の研究と 超低バックグラウンドガンマ線スペクトロメトリーの開発) 日時:2017年 2月 7日 (火) 16:20-17:50 場所:理学研究科H棟7階7階セミナー室(H701号室)

主査 :岸本 忠史

副查 :能町正治、青井考、嶋達志、吉田斉

論文要旨:

Among all nuclear isomers that exist in nature, tantalum-180m (180mTa) has the longest half-life of more than 1016 years. Due to the highly for- bidden transition with large spin parity difference from ground state, its half-life is yet to be finalized up until now. In this research, an ultra-low background HPGe detector system at Kamioka Underground Observatory was newly developed and utilized to observe the rare decay of 180mTa. Two phases of tantalum physics run were completed, which Phase II has further background reduction on the detector system. The detector performance and background condition during the tantalum measurement were analyzed. To optimize detection efficiency and further reduce the background level, Monte Carlo simulation and pulse shape discrimination method were also developed for the HPGe detector. The result of Tantalum Phase I and Phase II with total livetime of 358.2 days will be presented.