

Research Report

ICRR Inter-University Research Program 2021

Research Subject: Research and Development for XENONnT and future Dark Matter searches
Principal Investigator: Kai Martens
Participating Researchers: 山下雅樹, 風間慎吾, 原田莉奈, 井手隆心, 身内賢太朗, 竹内康雄, 水越慧太, 前田剛志, 森山茂栄. Masatoshi Kobayashi
Summary of Research Result : The main achievement of our group in the XENONnT experiment was that we brought the gadolinium water purification system, which takes technology developed for Super-Kamiokande at Kamioka, into operation at LNGS in Italy. A big contribution to the XENONnT physics program was a measurement of tritium in the air at the experiment, underground at LNGS. This measurement addresses one of the hypothetical interpretations of the low energy electron recoil excess observed in the XENON1T data, on which we are following up with XENONnT data and this measurement. Given the persisting COVID-19 pandemic and its ensuing travel restrictions our travel both within Japan to and from the Kamioka Observatory and inter-nationally to the experiment in Italy was severely limited. One crucial visit of our team member Kobayashi Masatoshi to Kamioka to perform a tritium measurement there and prepare for the ensuing one in Italy was possible due to Kyodo-Riyo support. The samples taken at both location are currently under analysis at a specialized lab here in Japan and the results are eagerly awaited by us and by the XENON collaboration. XENONnT is taking more data and new results are expected in the near future.
No. B11