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Solid Oxygen Ultra-cold Neutron Source for Fundamental Physics Experiments YUNCHANG SHIN, CHEN-YU LIU, Department of Physics, Indiana University/ IUCF — Ultra-cold neutrons (UCN) are neutrons with energy of a few hundred neV. This energy is so low that UCN experience total external reflection from material surfaces. High precise measurements of fundamental physics such as neutron lifetime measurement or neutron EDM are possible with UCN. However a deficiency of intensity restricts us from achieving meaningful measurements. A UCN source with higher intensity is necessary to perform these precise measurements. Solid oxygen may be an attractive choice as a UCN source with this demand. Theoretical calculations predicted the possible advantages of solid oxygen. However, it has been experimentally shown that the UCN production rate from solid oxygen highly depends on the crystal condition, especially at low temperatures. We are testing crystal growths of solid oxygen over a wide range of temperature. Preliminary results will be presented.

Yunchang Shin
Department of Physics, Indiana University/ IUCF

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