Contribution ID: **728**   Type: **not specified**

Application of Two-Dimensional Organic-Inorganic Hybrid Perovskites in Fast Neutron Detection

Neutron radiation fields frequently coexist with γ-rays, posing a significant challenge to ensure the accuracy of neutron detection. Two-dimensional (2D) organic-inorganic hybrid perovskites (OIHP) have been proven to be potential fast neutron scintillators due to their high light yield, fast response time, high density of hydrogen, and linear energy response. Here we find that the decay time of 2D OIHP to heavy charged particles is significantly faster than that to γ-rays. The unique characteristic endows 2D OIHP with good n/γ discrimination capability, with a figure of merit of 0.86 in Deuterium-Deuterium fusion reactions. Furthermore, we demonstrate the use of 2D OIHP as a next-generation scintillator for neutron imaging. It exhibits a record resolution of 2.00 lp/mm for fast neutron imaging, which is the highest resolution among perovskites so far. The research not only advances the application of perovskites in the field of neutron detection, but also provides a new alternative for the development of neutron detection technologies.

Primary authors: LI, Yang (Northwest Institute of Nuclear Technology);   SHANG, Xinlong (Northwest Institute of Nuclear Technology);   DU, Xue (Tsinghua University);   CHEN, Liang (Northwest Institute of Nuclear Technology);   RUAN, Jinlu (Northwest Institute of Nuclear Technology);   ZHANG, Yapeng (Northwest Institute of Nuclear Technology);   OUYANG, Xiaoping (Northwest Institute of Nuclear Technology)

Session Classification: Poster Session

Track Classification: Poster session