

ZnWO₄ anisotropic scintillators for directionality technique

Low-background anisotropic scintillators can be reliable detectors to investigate - through the directionality technique - those Dark Matter (DM) candidates inducing just nuclear recoils.

The directionality technique for such a kind of candidates is based on the study of the correlation between the nuclear recoils direction and the Earth motion in the galactic rest frame. In an anisotropic detector, the signal is expected to change with a peculiar behavior as a function

of the sidereal time. Among the anisotropic scintillators, the ZnWO₄ has unique features and is an excellent candidate detector. In particular, both the light output and the scintillation

pulse shape depend on the impinging direction of heavy particles with respect to the crystal axes; these two features can be independently exploited to study the directionality and to statistically discriminate recoils to gamma/beta radiation (that instead gives no anisotropic effect). Developments and perspectives of the low background ADAMO pioneer project to exploit deep underground the directionality approach by using anisotropic ZnWO₄ scintillators as well as its complementarity to existing positive results will be mentioned.

Primary authors: Dr DI MARCO, Alessandro (INFN Roma Tor Vergata); DAMA-KYIV COLL.

Presenter: Dr DI MARCO, Alessandro (INFN Roma Tor Vergata)