

Status and perspectives of the OREO (ORiEnted calOrimeter) project

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It is well known that inside an oriented crystal a strong acceleration of the e.m. shower development is observed, if a high energy (> 10 GeV) e^\pm or photon impinges within 0.1° from one of its crystallographic axes. This phenomenon can be exploited to develop novel ultra-compact calorimeters, capable of containing the energy of the incident particles as efficiently as much thicker non-oriented detectors, with an improved particle identification capability. Such a calorimeter has never been developed before, but the INFN ORiEnted calOrimeter (OREO) project is now aiming at assembling a first prototype composed of oriented PbWO_4 crystals. This contribution will present the status of the OREO project and the results of both numerical simulations and beamtests, performed at the CERN PS and SPS with a 3×1 and a 2×2 matrix of oriented PbWO_4 crystals. We will also discuss the potential application of such a detector in fixed target experiments and γ -ray telescopes.

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Authors: MONTI GUARNIERI, Pietro (University of Trieste (IT) and INFN Trieste (IT)); SELMI, Alessia (Università & INFN, Milano-Bicocca (IT)); GIANOLI, Alberto (Università e INFN, Ferrara (IT)); LOBKO, Alexander (Byelorussian State University (BY)); SYTOV, Alexei (Università e INFN, Ferrara (IT)); Dr MAZZOLARI, Andrea (INFN); RINALDI, Daniele (Università Politecnica delle Marche (IT)); DE SALVADOR, Davide (Università e INFN (IT)); VALLAZZA, Erik (Università & INFN, Milano-Bicocca (IT)); Prof. DAVI, Fabrizio (Università Politecnica delle Marche (IT)); LONGO, Francesco (University of Trieste (IT) and INFN Trieste (IT)); Dr SGARBOSSA, Francesco (Università e INFN, Ferrara (IT)); Dr PATERNÒ, Gianfranco (Istituto Nazionale di Fisica Nucleare); SAIBENE, Giosue' (Università & INFN, Milano-Bicocca (IT)); LEZZANI, Giulia (University of Insubria (Como, IT) and INFN Milano-Bicocca); BANDIERA, Laura (Università e INFN, Ferrara (IT)); PERNA, Leonardo (University of Insubria (Como, IT) and INFN Milano-Bicocca); MALAGUTTI, Lorenzo (INFN Ferrara (IT)); MONTALTO, Luigi (Università Politecnica delle Marche (IT)); ROMAGNONI, Marco (Università e INFN, Ferrara (IT)); MOULSON, Matthew (INFN e Laboratori Nazionali di Frascati (IT)); SOLDANI, Mattia (INFN e Laboratori Nazionali di Frascati (IT)); PREST, Michela (Università & INFN, Milano-Bicocca (IT)); KORJIK, Mikhail (Byelorussian State University (BY)); CANALE, Nicola (Università e INFN, Ferrara (IT)); NEGRELLO, Riccardo (Università e INFN, Ferrara (IT)); CUTINI, Sara (INFN sezione Perugia); MANGIACAVALLI, Sofia (University of Insubria (Como, IT) and INFN Milano-Bicocca); CARSI, Stefano (Università degli Studi dell'Insubria, Como (IT) & INFN, Milano-Bicocca (IT)); HAURYLAVETS, Viktor (Institut for Nuclear Problems, Belarusian State University); TIKHOMIROV, Viktor (Byelorussian State University (BY)); GUIDI, Vincenzo (Università e INFN, Ferrara (IT)); BARYSHEVSKY, Vladimir (Institut for Nuclear Problems, Belarusian State University)

Presenter: SELMI, Alessia (Università & INFN, Milano-Bicocca (IT))

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