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Methods for the detection of short-lived particles in the OPERA experiment

The OPERA experiment has recorded physics data for five years, from 2008 to 2012. The main goal of OPERA is to search for the appearance of tau neutrinos in the CNGS, a quasi pure muon neutrino beam from CERN to the Gran Sasso laboratory in Italy. The tau neutrino CC interactions are identified through the detection of tau lepton decays in the so-called Emulsion Cloud Chambers (ECC), made of passive lead plates interleaved with nuclear emulsion films.
The special procedures used to locate the neutrino interaction vertices in ECC and to detect the decays of short-lived particles (within ~1 mm) are described and their application to the search for neutrino charm production is presented.

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