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Neutron and Gamma-ray Detection in Reversed-Field Pinch Deuterium Plasmas in the RFX-mod Device MATTEO ZUIN, Consorzio RFX, Corso Stati Uniti 4, Padova, LUCA STEVANATO, Dipartimento di Fisica ed Astronomia dell'Università di Padova, Via Marzolo 8, Padova, Italy, EMILIO MARTINES, WINDER GONZALEZ, ROBERTO CAVAZZANA, Consorzio RFX, Corso Stati Uniti 4, Padova, DAVIDE CESTER, Dipartimento di Fisica ed Astronomia dell'Università di Padova, Via Marzolo 8, Padova, Italy, G. NEBBIA, INFN Sezione di Padova, Via Marzolo 8, Padova, Italy, LASZLO SAJO-BOHUS, Universidad Simón Bolívar, Caracas 1080A, Venezuela, GIUSEPPE VIESTI, Dipartimento di Fisica ed Astronomia dell'Università di Padova, Via Marzolo 8, Padova, Italy —
An experimental analysis of neutron and gamma-ray fluxes exiting purely ohmically heated plasmas in reversed-field pinch (RFP) configuration is presented. The diagnostic system, installed in the RFX-mod, is made of 2 scintillators (EJ-301 liquid and NaI(Tl)) coupled to flat-panel photomultipliers, which can be operated under magnetic fields. The production of neutrons and gamma rays in Deuterium plasmas is found to be strongly dependent on the Ohmic input power, with a threshold value of about 1.2MA in terms of plasma current level, below which low levels of gamma rays and almost no neutrons are detected. Neutron and gamma production is characterized by a bursty behavior, correlated to the spontaneous magnetic reconnection events, occurring almost cyclically in the RFP plasmas. The role of ion heating and particle acceleration during such events is discussed.

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