

Abstract Submitted  
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**Application of fractional diffusion models to perturbative transport experiments in JET** DIEGO DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory, PAOLA MANTICA, Euratom-ENEA-CNR, Italy, VOLKER NAULIN, J.J RASMUSSEN, EURATOM Risoe National Laboratory Denmark — A class of non-local models based on the use of non-Gaussian stochastic processes and fractional diffusion operators, has been proposed to describe non-diffusive transport in magnetically confined plasmas.<sup>1</sup> Previous applications of these models include the study of Lagrangian statistics of tracers in plasma turbulence, and the description of nondiffusive transport phenomenology.<sup>2</sup> Here we discuss the applications to perturbative experiments in JET involving fast cold pulse propagation and ICRH power modulation.<sup>3</sup> Local transport models have found problematic to reconcile the fast propagation of the cold pulses with the comparatively slower propagation of the heat waves generated by power modulation. Here we show that the fractional model can successfully describe both types of perturbations.<sup>4</sup>

<sup>1</sup>D. del-Castillo-Negrete, et al., Phys. Plasmas **11**, 3854 (2004); Phys. Rev. Lett. **94**, 065003 (2005), Phys. Plasmas **13**, 082308 (2006).

<sup>2</sup>Ibid.

<sup>3</sup>P. Mantica, et al., 19th Intern. Conf. on Fusion Energy, Lyon [IAEA, Vienna, 2002].

<sup>4</sup>D. del-Castillo-Negrete, et al., Nucl. Fusion **48** 075009 (2008).

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