

TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

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Non-Classical Transport and Fractional Diffusion

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Abstract.

We investigate a non-classical kinetic equation that describes particle transport in media with correlated scattering centers. Possible applications are neutron transport in pebble bed reactors, and light transmission through clouds. The equation is a time-dependent linear kinetic equation on an extended phase space, whose initial values are given by a functional of its solution. We discuss the rigorous derivation of the model from particle billiards. Furthermore, an asymptotic analysis in the limit of a small mean free path reveals a fractional diffusion equation.