1154-35-756 **Olivier Pinaud*** (pinaud@math.colostate.edu), Colorado State University, Department of Mathematics, Fort Collins, CO 80523. *Fractional White-Noise Limit and Paraxial Approximation for Waves in Random Media.*

This work is devoted to the asymptotic analysis of high frequency wave propagation in random media with long-range dependence. We are interested in two asymptotic regimes, that we investigate simultaneously: the paraxial approxima tion, where the wave is collimated and propagates along a privileged direction of propagation, and the white-noise limit, where random fluctuations in the back-ground are well approximated in a statistical sense by a fractional white noise. The fractional nature of the fluctuations is reminiscent of the long-range correlations in the underlying random medium. A typical physical setting is laser beam propagation in turbulent atmosphere. Starting from the high frequency wave equation with fast non-Gaussian random oscillations in the velocity field, we derive the fractional Itô–Schrödinger equation, that is, a Schrödinger equation with potential equal to a fractional white noise. The proof involves a fine analysis of the backscattering and of the coupling between the propagating and evanescent modes. Because of the long-range dependence, classical diffusion-approximation theorems for equations with random coefficients do not apply, and we therefore use moment techniques to study the convergence. (Received September 10, 2019)