1044-60-145   **Boris I Kunin*** (`kunin@math.uah.edu`), Department of Mathematical Sciences, University of Alabama in Huntsville, Huntsville, AL 35899. *A probabilistic model for slow crack propagation.*

The talk addresses prediction of life-time scatter for cracked brittle solids whose strength fluctuates on a microscale. We model a commonly observed mode of slow crack growth in brittle materials, namely a Markovian stochastic pattern of a microscopic random jump, followed by a random waiting time, followed by a random jump, and so on. The waiting times are related, on physical grounds, to random energy barriers at the arrest points, whereas random magnitudes of the jumps are treated within the existing framework of Crack Diffusion Theory. This leads to a description of crack growth as a random process whose transition probability density satisfies a hyperbolic PDE. Relation to probabilistic life-time prediction is discussed, and an illustrative example is considered. (Received August 29, 2008)