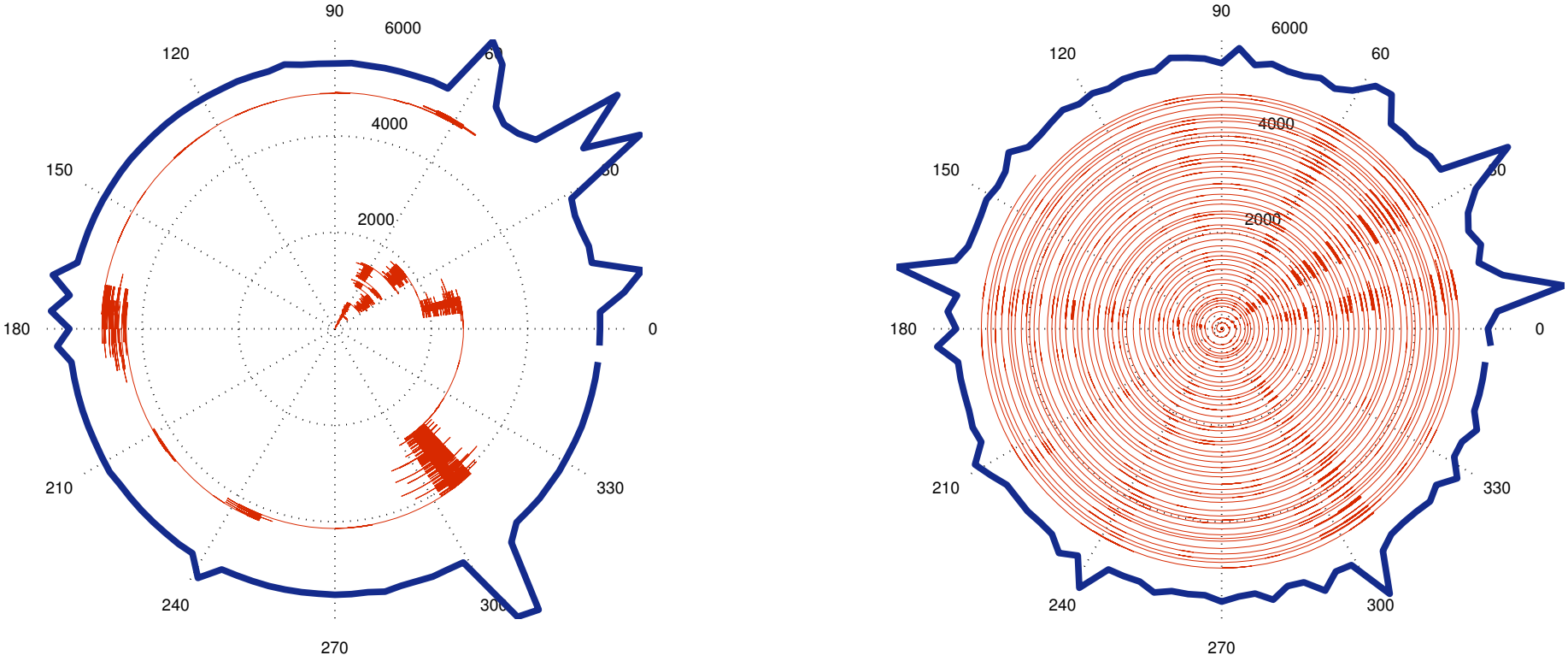
Percolation, sliding, localization and relaxation in glassy circuits

Daniel Hurowitz, Doron Cohen,

Ben-Gurion University



Brownian motion

The Einstein-Smoluchowski Relation (ESR):

$$D = \mu k_B T, \qquad k_B = 1$$

Relation between mobility (μ) and diffusion (D) reflecting microscopics (k_B) in universal way.

This is a special case of a fluctuation-dissipation relation between first and second moments.

Drift: $\langle x \rangle = vt, \qquad v = \mu F$

Diffusion: $\mathrm{Var}(x) = 2Dt$

ESR: $\dfrac{v}{D} = \dfrac{F}{T} \equiv s =$ affinity (linear response)

$s \equiv$ entropy-production-per-distance

FDT is valid close to equilibrium.

To what extent does the ESR hold?

Can it be derived from the NFT?

Non-equilibrium version?