

## Coherent Backscattering of diffusive systems

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Coherent Backscattering (CBS) is the scattering in the backward direction due to the constructive interference between time reversal paths in the diffusive sample having randomly oriented scatterers. Existence of such scattering even after averaging over the system configuration leads to a cone in the backscattered direction with the high intensity in the exact backscattered direction ( $\theta=0$ ) and reduces as the angle increases. This is also called as weak localization [1] since the light propagation in the forward direction is prohibited. Random walk model is used to describe the propagation of light in a diffusive sample.

Coherent backscattering is an important technique to provide the details about the diffusive systems such as the distribution of scatterers, effect of absorption. It also provides a direct measure of the transport mean free path which is the characteristic measure of disorder in the sample.

Levy flight is a special kind of random walk in which the step length distribution is given by power law distribution. An important characteristic of such abnormal random walk is that there are no well defined average quantities since the system has diverging moments. This kind of random walk of photons is studied in a material called Levy glass [2]. Levy glass is made up of randomly oriented scatterers in a glass matrix.

In this school, I would like to discuss about the set up and preliminary results of coherent backscattering experiments of some diffusive systems includes Levy glasses.

[1] D.S. Wiersma et.al, PRL **74**, 4193 (1995)

[2] Pierre Barthelemy et.al, Nature **453**,495 (2008)