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Circular polarization memory effect in low-coherence enhanced backscattering of light YOUNG L. KIM, PRABHAKAR PRADHAN, MIN H. KIM, VADIM BACKMAN, Northwestern University, Evanston, IL 60201 — We experimentally study the propagation of circularly polarized light in the subdiffusion regime by exploiting enhanced backscattering [(EBS), also known as coherent backscattering] of light under low spatial coherence illumination. We demonstrate for the first time, to the best of our knowledge, that a circular polarization memory effect exists in EBS over a large range of scatterers' sizes in this regime. We show that low-coherence EBS signals from the helicity preserving and orthogonal helicity channels cross over as the mean free path length of light in media varies, and that the cross point indicates the transition from multiple to double scattering in EBS.

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