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**Analysis of Faraday rotation and magneto-optical transmission in monolayer graphene** XINYANG WANG, IGOR SHOVKOVY, Arizona State University, SHOVKOVY'S GROUP TEAM — Graphene, a single atomic layer of graphite, was isolated in 2004. To understand the properties of this two dimensional material is one of the most popular and important research areas in condensed matter and materials physics. The study of optical conductivity in a strong magnetic field provides an interesting response that sheds light on the nature of spontaneous symmetry breaking of an approximate favor symmetry and causes the anomalous quantum Hall effect. We will discuss the possibility of different types of order parameters, associated with the quantum Hall ferromagnetism and magnetic catalysis. We use the results for the optical conductivity to calculate the magneto-optical absorption and the Faraday rotation angle, and compare the results with recent experiments. Also, we present a theoretical prediction for these properties in the regimes not yet explored in experiments.

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