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Title: Generation of Orbital Angular Momentum of Light and its application in Optofluidics

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Abstract: Polarized light carries spin angular momentum but if we give azimuthal phase dependence to a light beam, it can carry well defined Orbital Angular Momentum(OAM). Laguerre Gaussian and Bessel beam are examples of this kind of light. In this thesis we generated Laguerre Gaussian modes of light which carries well defined Orbital Angular Momentum. We generated these modes through two methods- • Through Spatial light Modulator(SLM). SLM is an electrically addressed, computer controlled device, which modulates the phase of light. • Through spiral phase plate. It is made up of transparent material which has varying thickness around circumference but constant in radial direction. After successfully generating different modes we detected and characterized OAM by taking diffraction pattern through single slit. This technique for sorting is not good enough for higher order LG modes. Finally we explored the deformations on Graphene oxide surface caused by Gaussian laser beam and different modes of LG beam by using nanometric sensitive technique.

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