

Abstract Submitted
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Direct Laser Writing: Comparing Two-Photon Polymerization and Low-One Photon Absorption Polymerization¹ KRIS TULLOCH, CHRISTOPHER LAFRATTA, CECILY ROSENBAUM, TAHMID SIDDIQUE, ANDERS DOLLARD, NASIF HOSSAIN, EJ WORTH, Bard College — New methods of microfabrication, such as two-photon polymerization (TPP), are important for the creation of modern micro-analytical, optical, mechanical, and electrical devices. TPP uses an ultrafast laser to polymerize a liquid resin into a solid polymer at a precise location referred to as a voxel. By scanning the laser in the resin a 3-D shape of arbitrary geometry can be created. Following the development of the unreacted resin, the microstructure can be imaged by electron microscopy. Microfabrication can also be done using low-one photon absorption (LOPA) polymerization, a more cost-effective method. The purpose of this project is to compare structures made by TPP and LOPA to evaluate if the simpler laser needed for LOPA can produce structures with the same characteristics as TPP. In particular, we set out to evaluate the voxel size limit, fabrication speeds, and proximity effect between the two methods. However, more data needs to be collected both for TPP and LOPA prepared samples to draw a conclusion as to the limits of each method. In addition, the proximity effect in both TPP and LOPA also needs further investigation.

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