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Design and Implementation of 3D Printable Optomechanical Components RYAN BULLIS, DYLAN MITCHELL, JULIE GUNDERSON, Hendrix College — Fused Filament Fabrication (FFF) 3D printing is a process by which three-dimensional objects are created by depositing layers of a material onto a hard, flat surface by a robot. It is often referred to as an 'additive manufacturing' technique because material is added in successive layers to create an object. Because many scientific applications require parts that are expensive to purchase or manufacture, 3D printing custom parts for scientific instrumentation can save (shipping and/or manufacturing) time and money, and it requires only one compact, computer-controlled robot. Thus, 3D printable scientific parts and equipment can drive down the costs of scientific research and can advance the pace of research progress. Here, we present a library of 3D printable optomechanical components that are compatible with commercial optomechanical parts. These components were tested for their optical stability and durability in home-built optical systems constructed entirely from 3D printed optomechanical components, and we demonstrate that optical systems built using 3D printable optomechanical components are comparable to their more expensive, commercially available counterparts. Thus, we expect our library of 27 3D printable optomechanical components to find utility in scientific research and teaching laboratories.

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