COLLOIDAL ADDITIVE MANUFACTURING USING PROJECTION BASED LIGHT DIRECTED ELECTROPHORETIC DEPOSITION

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Electrophoretic deposition (EPD) has been used industrially for nearly century for deposition of paint and barrier coatings. Traditionally, it has been used to create unpatterned thin films of various materials such as metals, ceramics, and polymers. Recently, we have demonstrated the ability to use a photoconductive electrode system to create millimeter scale patterns and structures in electrophoretically deposited films, the first steps to turning EPD into an additive manufacturing technique. Here, we present improvements to the technique that increase overall resolution and material set as well decrease feature size to 10s of microns by using a novel projection system. We also detail the our attempts at applying LD-EPD to creating microarchitected materials.

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