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Effect of lateral vibrations during convective deposition TANYAKORN MUANGNAPOH, ALEXANDER WELDON, JAMES GILCHRIST, Lehigh University — Vibration-assisted convective deposition is an advanced technique for improving a convective deposition. By adding a mechanical substrate vibration, drastic alterations of an interfacial liquid surface and an evaporate rate were observed. Bond, capillary and Reynolds dimensionless numbers were investigated for describing a change of an interfacial liquid surface. In this experiment, aqueous binary suspensions of colloidal microspheres and nanoparticles were used for studying effect of the amplitudes (0-250 μm) and the frequencies (1-50 Hz) of substrate vibration. The quality of deposited thin films was characterized by using a confocal laser scanning microscope, a scanning electron microscope and an image analysis. The monolayer structures formed from this rapid process can be used in a variety of optical, chemical, and biochemical sensing applications such as optical microlens arrays, microporous membranes and cell capture substrates.

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