Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Advanced understanding of paper coating structure and its relationship to coating performance JIAN YANG, LANFANG LI, JOHN ROPER, VALERIY GINZBURG, COLMAR WOCKE, REBECCA SMITH, The Dow Chemical Company — Paper coatings have been utilized to improve paper performance for decades, for example, for improving brightness, opacity, gloss, stiffness, ink acceptance, printability, and smoothness. In thermal paper, coatings are employed to impart improved thermal, morphological and mechanical properties often through the incorporation of hollow spheres into the coating film. Hollow sphere pigments having well controlled size and narrow size distribution provide a unique opportunity to model and study the particle packing phenomena and its effect on coating film strength, smoothness and thermal properties. This talk introduces a multi-dimensional modeling approach in paper coating modeling, with a special interest in microscopic mechanistic model. Based on these approaches we have seen that control of binary packing and local structure lead to improved and balanced coating mechanical property and thermal conductivity. This will enable us to achieve better coating materials using guided design of single particle geometry and formulation.

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Date submitted: 11 Nov 2016 Electronic form version 1.4