

## **Variability Issues in 3-D Clock Distribution Networks**

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The design process of vertically integrated systems demonstrates distinct differences as compared to the design of traditional planar systems. Providing a robust clock distribution system is of paramount importance to exploit the benefits offered by volumetric integration. The challenges in successfully performing this task in a multi-plane circuit are discussed in this talk. Considering the inherent variations in the manufacturing process, design guidelines for 3-D ICs are provided. Based on these guidelines, new 3-D clock network topologies are presented where process variability is efficiently managed.