3D-ICE: the new 3D Interlayer Cooling Emulator for thermal simulation of 3D ICs

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Web Page : http://esl.epfl.ch/3D-ICE

We propose to demonstrate 3D-ICE: the first-ever simulator built for the transient thermal analysis of 2D-3D ICs that have interlayer liquid cooling built in them. This simulator is based on the Compact Transient Thermal Modeling for forced convective cooling advanced by our research group. As inputs, 3D-ICE requires easy to understand project files describing the structural and material properties of the ICs along with the description of their heat sinks (conventional air-cooled or liquid-cooled). As output, 3D-ICE generates the complete transient/steady-state temperature response of the entire 2D/3D IC structure. Thus 3D-ICE provides a power platform for VLSI design, architectural exploration, heat-sink design, testing for new thermal modeling methodologies, and various other research and development efforts in the area of 3D ICs and liquid cooling of electronics. Currently in the second-generation, more than 70 research groups across the world have downloaded it and are actively using it for their research since 3D-ICE was first released in September 2010.