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Time-Resolved Visualization of Görtler Vortices in a Pulsed Convex Wall Jet using Fast Pressure-Sensitive Paint[1] JAMES GREGORY, The Ohio State University, RON DANON, DAVID GREENBLATT, Technion - Israel Institute of Technology — The time-resolved formation and structure of Görtler vortices in a pulsed convex wall jet are studied in this work. While the presence of Görtler vortices in laminar boundary layers on concave surfaces can be clearly observed, their presence in wall jets flowing over convex surfaces is difficult to discern due to transition to turbulence in the outer part of the jet. This work employed fast-response pressure-sensitive paint (PSP), which has a documented flat frequency response greater than 5 kHz, to visualize the time-resolved formation of the wall jet and the details of the Görtler vortices. The radius of curvature of the wall jet was 8 cm, and the Reynolds number (based on slot height and jet exit velocity) was varied between 5×10^2 and 4×10^4. The characteristic spanwise wavelength of the vortices was studied as a function of jet Reynolds number. Furthermore, as the Reynolds number was increased, various secondary instabilities were observed that led to laminar-turbulent transition.

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