

Abstract Submitted  
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**PIVT Investigation on Film Cooling in Turbine Blade** REBECCA MALISH, JORDI ESTEVADEORDAL, RON BUNKER, GE GLOBAL RESEARCH THERMAL SYSTEMS TEAM — An investigation using particle image velocimetry and thermography (PIVT) on the film cooling location of turbine blades in a cascade is presented. The laser scattering from seeding particles is captured with double exposure PIV camera, and fluorescence emissions are captured with ICCD camera for ratio thermometry. The technique allows capturing the velocity and temperature distributions of the particles at varying blowing ratios. The seeding particles were immersed in two locations of the cascade, the first was upstream of the blade; the second was inside the blade to allow for mixing with the coolant. The combined velocity and temperature maps allow understanding the film holes cooling effectiveness and clearly identify areas and holes that are more effective at cooling. PIVT gives a two-dimensional measurement than other techniques cannot provide and it is able to map the velocity and temperature in various viewing flow areas with the seeding particles.

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