

Abstract Submitted  
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**Non-intrusive methods for particle removal from smooth and rough surfaces** THOMAS LIEBNER, GARY SETTLES, Penn State — Previous researchers have characterized particle removal from a smooth surface as a function of the mean wall shear stress induced by the impingement of a turbulent air jet. We expanded upon this by an experimental study of particle removal at large standoff distances (and correspondingly low wall shear stresses) from both smooth and rough surfaces (APS/DFD 2006, GH007). The particle removal efficiency is now considered as a function of the induced wall shear stress, particle size, nozzle configuration, and impingement-surface properties. The behavior of the jet-impingement footprint size for shear stress sufficient to remove particles is considered. A range of particle sizes and surfaces is studied, with special emphasis on particle removal from fabrics. This is characterized in terms of the applied jet-impingement shear stress and the fabric thread spacing normalized by particle diameter.

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