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Frictional drag measurements for pitted surface roughness<sup>1</sup> KAREN FLACK, MICHAEL SCHULTZ, United States Naval Academy — An important unanswered question in fluid mechanics is the prediction of the frictional drag for a generic surface roughness. Based on previous research by the authors and others, a new correlation was proposed to estimate the frictional drag for a surface covered with three-dimensional, irregular roughness in the fully rough regime. The correlation relies solely on a measurement of the surface roughness profile. A relationship is given for the equivalent sandgrain roughness height as a function of the root-mean-square roughness height and the skewness of the roughness probability density function. The correlation was developed using results from boundary layer measurements. Towing tank tests were performed to obtain the overall increase in drag due to surface roughness in order to validate the correlation for a wider range of surfaces. Results from rough surfaces with pitting (negatively skewed pdf's) will be presented.

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