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The Role of Intrinsic Material Properties on Shock-Induced Sliding MARK COLLINSON, DAVID CHAPMAN, DANIEL EAKINS, Institute of Shock Physics, Imperial College London — The high strain-rate behaviour of multi-component systems is often dominated by mediation at material interfaces. The extent to which a material's microstructure influences dynamic friction and relative sliding response remains an area of active study. We present results of a recent study into the behaviour of dry metallic interfaces under the passage of a controlled loading wave. The role of material strength linked to grain size and precipitates have been investigated through experiments on stainless steel and aluminium components of varying alloy composition and microstructure. Held in close contact along a single planar interface, oblique shock waves were generated along this boundary by direct copper flyer impact at velocities in the range 250ms^{-1} - 600ms^{-1}. Both the 100mm and 13mm bore gas guns located at Imperial College London were utilised for this purpose. Multiple channels of frequency shifted PDV were employed to measure the individual far field responses of the specific materials, while a line-imaging VISAR system was used to directly record the velocity profile across the contact interface, providing a measure of any spatially dependent response. Comparisons of these results against current generation hydrocode models are presented, with good agreement attained with PDV measurements in the far field.

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