

Abstract Submitted  
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**Effects of Energetic Particles on Friction Behavior of Diamond-like Carbon**<sup>1</sup> KE WANG, HONG LIANG, Texas A&M University, JEAN MICHEL MARTIN, THIERRY LE MOGNE — This research investigates the failure mechanisms of damages induced by interactions of energetic particles and a diamond-like carbon (DLC) film. Experimental approaches include using an ultra-high vacuum tribometer with attached spectroscopic analysis techniques to generate those particles and conduct in-situ tribological testing. Analytically, using multiple-peaks deconvolution to analyze carbon 1s X-ray photoelectron spectroscopy (XPS) results, the bonding information of *C* atoms on the surface of DLC film has been extracted. Comparing with friction test results, it is found that the frictional behavior of DLC film (after the reaction with energetic particles) strongly depends on the ratio between *sp*<sup>3</sup> and *sp*<sup>2</sup> hybridization of *C* atoms on the surface.

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