

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Pressure Mapping Within a Tribological Contact with Fluorescence Imaging MOURAD CHENNAOUI, JANET WONG, Imperial College London, London, UK — In many lubricated applications from gears to MEMS, the operating pressure must be known in order to achieve optimum performance and design. However, due to the small length scale that exists at the tribological contact, placing sensors is unpractical to allow direct pressure measurement. Instead, the pressure is often inferred from indirect techniques such as film thickness measurements, photo-elasticity or the use of micro-transducers. Although these methods lead to good pressure approximations, they generally involve calibrations on well-defined setups. The results obtained can be difficult to interpret or suffer from limited spatial resolutions. In this work, fluorescent molecules in a lubricating fluid are used as probes for in-situ pressure measurements. The change in the probe's photophysical behaviour with pressure is utilised to quantitatively correlate the pressure distribution in a tribological contact such as the one found in elastohydrodynamic lubrication regimes.

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Date submitted: 27 Dec 2010

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