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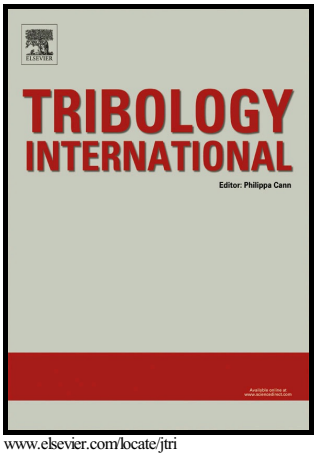

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Experimental observation on the surface dimple variations in starved EHL of sliding steel-glass point contacts

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Abstract：In this study, optical interferometry experiments were performed to investigate the surface dimple variations in elastohydrodynamic lubrication (EHL) of point contacts under a simple sliding condition. Two polybutene (PB) lubricants with high viscosity were used as the lubricants. By imposing a light load and a heavy load, the influence of the sliding velocity on the variation of the surface dimples in fully flooded and starved lubrication conditions was explored. It was found that the increase of severity of the oil starvation played a similar role as the increase of the sliding velocity. At severe oil starvation condition, under all the sliding velocities and loads, all surface dimples disappeared and the contact was flat and elongated.

Keyword: EHL; surface dimple; oil starvation; simple sliding;

1. Introduction

In 1970s, Chiu and Sibley [1] observed in their interferometry experiments that a surface dimple might occur in the central area of the lubricated contact at a very low velocity, and the oil film thickness in the area increased when the glass disk was moving while the steel ball was stationary. In order to understand the mechanism of