View Abstract

	CONTROL ID: 3644138
	PRESENTATION TYPE: Oral
	CURRENT TOPIC: Condition Monitoring
	TITLE: Electrical impedance spectroscopy enabled in-depth lubrication condition monitoring
	AUTHORS (LAST NAME, FIRST NAME): Yu, Min[1]; Zhang, Jie[1]; Kirkby, Thomas[1]; Joedicke, Arndt[2]; Reddyhoff, Tom[1]
	INSTITUTIONS (ALL): 1. Imperial College London, London, United Kingdom. 2. Shell Global Solutions (Deutschland) GmbH, Hamburg, Germany.
	ABSTRACT BODY: **Body:** Electrical contact resistance or capacitance as measured between two interfaces of a lubricated contact has been used in tribometers, partially reflecting the lubrication condition. In contrast, the electrical impedance spectroscopy (EIS) provides rich information of magnitude/phase spectrum, which is thoroughly investigated using a combination of electrical circuit models (equivalent to the lubricated contact) and in-situ measurements with a ball-on-disc contact. Results indicate a promising potential of EIS in lubrication condition monitoring, including the variation of lubricant film thickness as estimated using high-frequency magnitude response; the transition between full-film, mixed, and boundary lubrication regimes, as differentiated using extracted electrical resistance together with phase spectrum; the forming of anti-wear boundary film, where extra resistor/capacitor are added; and the degradation of lubricant, such as fuel dilution, oil oxidization, and water emulsifying.
	KEYWORDS: Maintenance:Oil Condition Monitoring, EHL:EHL Film Geometry, Boundary Lubrication:Boundary Lubrication Test Methods.
	Biography (limit 750 characters-about 100 words): Min Yu received a B.Eng. degree in Mechanical Engineering from Xi'an Jiaotong University, Xi'an, China, in 2011, and M.Sc. in Mechatronic Control Engineering from Zhejiang University, Hangzhou, China, in 2014, followed by a Ph.D. in Control and Power Group at Imperial College London, in 2018. He is currently a Research Associate in Tribology Group in the Department of Mechanical Engineering, Imperial College London. Dr Min Yu's recent research focuses on lubrication condition monitoring, involving non-destructive sensing of optical, acoustic, electrical methods. He has specialized in developing embedded platforms and prototypes to validate newly proposed concepts and methods, in combination with analytical models and numerical simulations.
	Commercial Bias: (none)
	Freedom from Comm Bias: By checking this box, I affirm that this presentation will be free of any commercial bias toward any company or product.
	Keyword:Other: (none)

© Clarivate Analytics | © ScholarOne, Inc., 2021. All Rights Reserved.
ScholarOne Abstracts and ScholarOne are registered trademarks of ScholarOne, Inc.
ScholarOne Abstracts Patents #7,257,767 and #7,263,655.

@ScholarOneNews | System Requirements | Privacy Statement | Terms of Use

Product version number 4.17.4 (Build 125). Build date Wed Sep 15 11:17:14 EDT 2021. Server ip-10-236-29-78