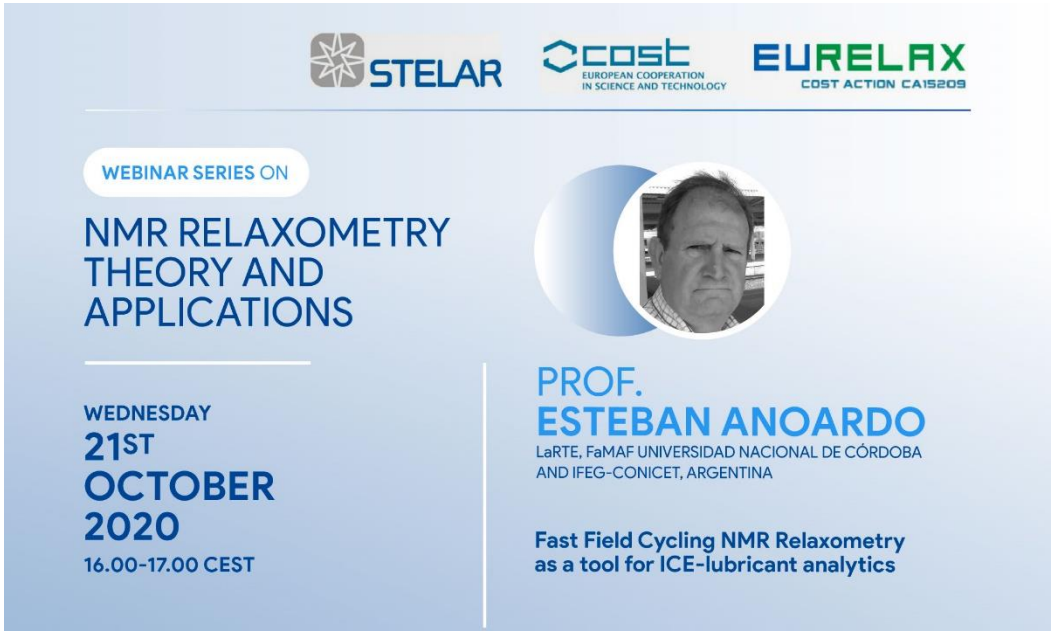

Abstract

Fast field-cycling NMR relaxometry as a tool for ICE-lubricant analytics

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We will address some elemental questions regarding why NMR relaxometry (and NMR in general) was not considered yet as a standardized technique for the characterization of internal combustion engine (ICE) lubricants. In contrast, how we understand the success of FTIR? We will show the potentialities of NMR relaxometry for this purpose, and specially, the enhanced sensitivity of field-cycling relaxometry at low magnetic fields.

Author Biography

E. Anoardo received his degree in physics at FaMAF-UNC (Córdoba-Argentina) where he had a first contact with NMR relaxation in liquid crystals (LCs). His PhD. thesis was focused in the molecular dynamics of thermotropic LCs incorporating field-cycling NMR experiments through a home-made machine, also in Córdoba. During 2000-2001 he spent some time working with Stelar in Italy, where he gained experience in FFC technology and applications. After that experience he joined the group of Rainer Kimmich in Ulm, Germany, supported by the Alexander von Humboldt Foundation, where he developed a FFC relaxometry variant where NMR relaxation is examined under acoustic stimulation. Once back in Córdoba he created the LaRTE (Laboratorio de Relaxometría y Técnicas Especiales) where the main research lines today are FFC-MRI relaxometry, NMR-relaxometry in soft matter and lubricants & oils. Along the last years, the LaRTE held successful collaborations with different groups in Europe, mainly the School of Chemical Sciences at DCU in Dublin, Technical Physics Department of the Technical University of Ilmenau and the Institute of Mechanical Process Engineering and Mechanics and the Pro 2 NMR group in the Karlsruhe Institute of Technology (KIT).