



All-optical microfiber interferometer sensors

David Monzón-Hernández¹, Carlos Moreno-Hernández^{1,*}, Iván Hernández-Romano¹, and Joel Villatoro^{2,3}

¹Grupo de Sensores Ópticos y Microdispositivos, Centro de Investigaciones en Óptica, León, Guanajuato, México

²Dept. of Communications Engineering, Escuela Técnica Superior de Ingeniería (ETSI) de Bilbao. University of the Basque Country (UPV/EHU), Alda. Urquijo s/n, E-48013 Bilbao, Spain

³IKERBASQUE –Basque Foundation for Science, E-48011 Bilbao, Spain

ABSTRACT

Optical fiber sensors based on interference phenomena are devices broadly used in a number of applications for measuring and controlling physical or chemical parameters of inorganic and organic samples. Single arm fiber interferometers based on modal interference, are miniature, easy to fabricate, versatile and under some schemes have multiple parameter sensing capabilities. Although these devices are highly sensitive to environmental perturbations, here we demonstrate that tapering process, used to obtain microfibers, could improve this sensitivity especially for refractive index sensing. In this talk we will briefly describe the state of the art of modal interferometers, then the discussion will focus on two novel multifunctional microfiber interferometer sensors, in Mach-Zehnder and Fabry-Perot configuration, proposed by our group.