Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Inspecting the microstructure of electrically active defects at the Ge/GeO$_x$ interface MARCO FANCIULLI, Department of Material Science, University of Milano Bicocca, Italy and MDM Laboratory, IMM-CNR, Agrate Brianza, Italy, SILVIA BALDOVINO, ALESSANDRO MOLLE, MDM Laboratory, IMM-CNR, Agrate Brianza, Italy — High mobility substrates are important key elements in the development of advanced devices targeting a vast range of functionalities. Among them, Ge showed promising properties promoting it as valid candidate to replace Si in CMOS technology. However, the electrical quality of the Ge/oxide interface is still a problematic issue, in particular for the observed inversion of the n-type Ge surface, attributed to the presence of dangling bonds inducing a severe band bending [1]. In this scenario, the identification of electrically active defects present at the Ge/oxide interface and the capability to passivate or anneal them becomes a mandatory issue aiming at an electrically optimized interface. We report on the application of highly sensitive electrically detected magnetic resonance (EDMR) techniques in the investigation of defects at the interface between Ge and GeO$_2$ (or GeO$_x$), including Ge dangling bonds and defects in the oxide [2]. In particular we will investigate how different surface orientations, e.g. the (001) against the (111) Ge surface, impacts the microstructure of the interface defects. [1] P. Tsipas and A. Dimoulas, Appl. Phys. Lett. 94, 012114 (2009) [2] S. Baldovino, A. Molle, and M. Fanciulli, Appl. Phys. Lett. 96, 222110 (2010)

Marco Fanciulli
Department of Material Science, University of Milano Bicocca, Italy
and MDM Laboratory, IMM-CNR, Agrate Brianza, Italy

Date submitted: 29 Nov 2011 Electronic form version 1.4