

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Characterizing Individual Group V donors in Silicon CYRUS F. HIRJIBEHEDIN, PHILIPP STUDER, STEVEN R. SCHOFIELD, VERONIKA BRAZDOVA, DAVID R. BOWLER, NEIL J. CURSON, UCL, UK — The study of dopants in silicon has been rapidly growing in importance because the dimensions of semiconductor devices have now decreased to the point where their functionality relies upon only a few atoms. Group V donors are especially interesting due to their potential application in spintronics and quantum computing. Whereas P dopants have been extensively studied, comparatively little is known about the characteristics of other group V donors. Using a combination of ion implantation and cross-sectional scanning tunneling microscopy (XSTM) and, we study individual Bi and Sb atoms in the cleaved Si(111)2x1 surface. High-resolution STM topography images and scanning tunneling spectroscopy (STS) data allow us to probe the structural and electronic properties of these individual dopants in silicon. Density functional theory (DFT) calculations further support our structural assignments.

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Date submitted: 08 Dec 2010

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