

Abstract Submitted  
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**Double Dot Induced by a Single Defect in a Silicon Nanowire** TED THORBECK, JQI, NIST & U. of Maryland, NEIL ZIMMERMAN, NIST, AKIRA FUJIWARA, YUKINORI ONO, YASUO TAKAHASHI, HIROSHI INOKAWA, NTT — Double quantum dots are an essential feature for several schemes of semiconductor quantum computation. We have seen both intentional, gate defined, double quantum dots as well as unintentional, defect induced, double quantum dots in our devices, which consist of a silicon nanowire with two layers of poly-silicon gates. This talk will give evidence, including SIMON simulations, that both of the dots we have seen are caused by one physical defect, where one dot corresponds to the defect and the other dot is induced by the defect at the interface of the silicon and the silicon dioxide. It has been previously proposed that one dopant can induce a quantum dot at the interface; we hope to go beyond this and show that the defect and the induced dot can act as a double quantum dot. This work could be useful for recent proposals for quantum computation using defects in silicon such as dopants and dangling bonds.

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