

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**High electron density 2DEGs at 111 SrTiO<sub>3</sub>/SmTiO<sub>3</sub> interfaces**  
SANTOSH RAGHAVAN, SUSANNE STEMMER, University of California Santa Barbara, STEMMER RESEARCH GROUP TEAM — (001) SrTiO<sub>3</sub> quantum wells formed in structures such as RTiO<sub>3</sub>/SrTiO<sub>3</sub>/RTiO<sub>3</sub> (R = Gd or Sm) exhibit two-dimensional electron gases (2DEGs) that exhibit ferromagnetism and non-Fermi-liquid behavior. 2DEGs are also expected for (111) quantum wells, which furthermore form a honeycomb lattice that is susceptible to geometric frustration and nontrivial band structures. In this work, we present the growth of high quality SrTiO<sub>3</sub> and SmTiO<sub>3</sub> layers on (111) LSAT substrates using a hybrid molecular beam epitaxy technique. Structural and electrical characterization show atomically sharp (111) interfaces between SrTiO<sub>3</sub> and SmTiO<sub>3</sub>, and the presence of a high charge carrier density of  $\sim 3 \times 10^{14} \text{ cm}^{-2}$ . We will discuss results of magneto-transport studies in highly confined quantum wells that are only a few atomic planes thick and compare them with results from (001) interfaces.

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Date submitted: 21 Oct 2014

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