

Abstract Submitted  
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**Phase diagram of the even-denominator fractional quantum Hall state at  $\nu = 1/2$  in wide quantum wells** JAVAD SHABANI, MANSOUR SHAYEGAN, Princeton University — We have studied the fractional quantum Hall (FQH) effect in very high quality two dimensional electrons confined to GaAs single wide quantum wells. In these systems typically two electric subbands are occupied at zero magnetic field and the electron charge distribution in the quantum well is bilayer-like. For a symmetric charge distribution and appropriate electron density, a unique even-denominator FQH state emerges at filling factor  $\nu = 1/2$  which has no counter-part in standard, single-layer systems [1]. We have revisited this problem by studying wide quantum well samples with narrower well widths,  $47 \leq w \leq 64$  nm, and hence larger tunneling,  $\Delta$  (up to 35 K). The new  $\nu = 1/2$  data in these narrower samples allow us to expand the  $d/l_B$  vs.  $\Delta/(e^2/4\pi\epsilon l_B)$  phase diagram for the stability of the  $\nu = 1/2$  FQH state ( $d$  is the layer distance and  $l_B$  is the magnetic length). Based on this phase diagram, we find that, it is not clear whether this state has a Pfaffian or a two-component Halperin origin.

[1] Y. W. Suen et al., Phys. Rev. Lett. 72, 3405 (1994).

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