

Abstract Submitted  
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**Possible spin liquid phase of the  $S = 1/2$  J1-J2 triangular Heisenberg model**<sup>1</sup> ZHENYUE ZHU, UC Irvine, DAVID HUSE, Princeton University, STEVEN WHITE, UC Irvine — We study the  $S = 1/2$  Heisenberg model on the triangular lattice with nearest neighbor interaction  $J_1$  and next nearest neighbor interaction  $J_2$  with the density matrix renormalization group. We are able to study long open cylinders with width up to 9 lattice spacings. At  $J_2/J_1 = 0.1$ , we find a possible spin liquid (SL) state with short range spin-spin, bond-bond and chiral correlation lengths, bordered by a classical  $120^\circ$  Néel order pattern at small  $J_2$  and a two sub-lattice collinear magnetic ordered state at  $J_2 > 0.17$ . We identify two quasi-degenerate ground states in the SL phase on long even cylinders, with an energy gap that decreases exponentially with the cylinder width. We also observe a dimerization effect on odd cylinders. We further find a large spin triplet gap. Our evidence supports a fully gapped SL state for the intermediate phase.

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