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**Mark W Gross\*** (mgross@math.ucsd.edu), UCSD Mathematics, 9500 Gilman Drive, La Jolla, CA 92093-0112, and **Rahul Pandharipande** and **Bernd Siebert**. *The Tropical Vertex*.

Elements of the tropical vertex group, introduced by Kontsevich and Soibelman, are formal families of symplectomorphisms of the 2-dimensional algebraic torus. We prove ordered product factorizations in the tropical vertex group are equivalent to calculations of certain genus 0 relative Gromov-Witten invariants of toric surfaces. The relative invariants which arise have full tangency to a toric divisor at a single unspecified point. The method uses scattering diagrams, tropical curve counts, degeneration formulas, and exact multiple cover calculations in orbifold Gromov-Witten theory. (Received September 10, 2009)