1057-81-384 **Davide Gaiotto**, **Gregory W Moore** and **Andrew Neitzke*** (neitzke@math.utexas.edu), Department of Mathematics, 1 University Station C1200, Austin, TX 78712-0257. *Wall-crossing and Hitchin systems. Part 2: Dimensional reduction, hyperkahler metrics and Hitchin's equations.* Preliminary report.

(This talk is a continuation of Part 1.) We consider reducing the field theory from 4 to 3 dimensions on $S^1$. The moduli space of the 3-dimensional theory is a hyperkähler manifold, which in many examples is a moduli space of solutions of Hitchin's equations. The vacuum expectation values of supersymmetric line operators then give holomorphic functions on this moduli space. We explain how these vacuum expectation values can be computed using a variant of the thermodynamic Bethe ansatz, and how this leads to a new description of the hyperkähler metric on the moduli space. Moreover, adding surface operators to the story, we similarly obtain a new description of the solutions of Hitchin's equations themselves. (Received January 26, 2010)