VERTEX ALGEBRAS FOR 3D $N = 4$ GAUGE THEORIES AND PARTIAL THETA FUNCTIONS

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ABSTRACT. The Higgs and Coulomb branch of 3d $N = 4$ gauge theories have attracted much attention from mathematicians since the work of Braverman-Finkelberg-Nakajima. On the other hand, Gaiotto introduced the A- and B-twisted boundary vertex algebras as additional invariants of these gauge theories, which can be viewed as refinements of the Higgs and Coulomb branches. In this talk, I will describe the properties of these vertex algebras in the special case of abelian gauge groups. I will focus on interesting features in geometry (such as symplectic resolutions) and number theory (such as partial theta functions). This is joint work in progress with Andrea Ferrari and Tomoyuki Arakawa.