Line defect Schur indices, Verlinde algebras and $U(1)_r$ fixed points

Fei Yan

Department of Physics, University of Texas at Austin

Given an $\mathcal{N} = 2$ superconformal field theory, one could consider Schur index $\mathcal{I}_L(q)$ in the presence of a half line defect L. Recently Cordova-Gaiotto-Shao found that $\mathcal{I}_L(q)$ admits an expansion in terms of characters of the chiral algebra $\mathcal{A}$ introduced by Beem et al., with simple coefficients $v_{L,\beta}(q)$. In the poster I will report a new feature of this expansion: the $q \to 1$ limit of the coefficients $v_{L,\beta}(q)$ is linearly related to the vacuum expectation values $\langle L \rangle$ in $U(1)_r$-invariant vacua of the theory compactified on S^1. This relation can be expressed algebraically as a commutative diagram involving three algebras: the algebra generated by line defects, the algebra of functions on $U(1)_r$-invariant vacua, and a Verlinde-like algebra associated to $\mathcal{A}$. Our evidence is experimental, by direct computation in the Argyres-Douglas theories of type (A_1, A_2), (A_1, A_4), (A_1, A_6), (A_1, D_3) and (A_1, D_5). In the latter two theories, which have flavor symmetries, the Verlinde-like algebra which appears is a new deformation of algebras previously considered. This is joint work with Andrew Neitzke.