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Weyl orbit functions and conformal field theory

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The modular S matrix is fundamental in any rational conformal field theory, including the Wess-Zumino-Witten (WZW) models. A strong similarity was noticed by the authors between the WZW modular S matrix, or affine S matrix, and certain discretized orbit functions. New properties of the orbit functions were found, mimicking the known characteristics of the affine S matrix. After reviewing this work, we will describe further new relations obeyed by the orbit functions. Finally, we will show how a discretization of the orbit functions, different from the original one, produces exactly the affine S matrix.

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