

EIGENFORM PRODUCT IDENTITIES FOR DEGREE-TWO SIEGEL MODULAR
FORMS

Alexandra M Walsh

(alexandra_walsh@brown.edu)

Clemson University

[Mentor:Jim Brown]

Abstract of Report Talk: In his paper “On Eigenform Relations Between Monomial Series” (2000), Eknath Ghate proves that there are finitely many pairs of full-level, degree-one eigenforms f and g whose product fg is also an eigenform. We prove a partial generalization of this theorem for degree-two Siegel modular forms. The problem splits into two cases: in case one, FG is an Eisenstein series, and in case two, FG is a cusp form. For the Eisenstein series case, we use the Siegel Φ operator, a mapping from Siegel degree-two to degree-one modular forms, to show that there is only one pair of Eisenstein series eigenforms F and G for which FG is an eigenform. For the cusp form case, we use the Rankin-Selberg method to give a condition under which FG cannot be an eigenform. We provide one example of an eigenform product for which FG is a cusp form, and we conjecture that this is the only such example.

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