Mating quadratic maps with the modular group

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In 1994 S. Bullett and C. Penrose introduced a one complex parameter family of holomorphic correspondences, which we denote F_a, and proved that for every real parameter in the connectedness locus such correspondence is a mating between a quadratic polynomial and the modular group. They conjectured that this is the case for every parameter in the connectedness locus.

We show here that matings between the modular group and rational maps in the parabolic quadratic family $Per_1(1)$ provide a better model: we prove that every member of the family F_a which has the parameter in the connectedness locus is such a mating. Moreover, we develop a dynamical theory for such a family which parallels the Douady-Hubbard theory of quadratic polynomials. This is a joint work with S. Bullett.