1064-37-235 **Kevin M. Pilgrim*** (pilgrim@indiana.edu), Dept. Math., Rawles Hall, Indiana University, Bloomington, IN 47405. *Heights, modular correspondences, and complex dynamics.* Preliminary report.

Let $f : \mathbb{P}^1\mathbb{C} \to \mathbb{P}^1\mathbb{C}$ be a rational function of degree $d \geq 2$ for which the post-critical set $P_f = \{f^n(c) : f'(c) = 0, n > 0\}$ has four points. The moduli space of configurations of four labelled points in $\mathbb{P}^1\mathbb{C}$ is naturally $\mathcal{M} = \mathbb{H}/\mathbb{P}\Gamma(2)$, where $\mathbb{H} = \{\tau \in \mathbb{C} : \mathrm{Im}(\tau) > 0\}$. Associated to f is a finite correspondence on $\mathcal{M}$ with a distinguished fixed-point. This correspondence lifts under the universal covering $\mathbb{H} \to \mathcal{M}$ to a map $\sigma_f : \mathbb{H} \to \mathbb{H}$ with a unique fixed-point. In turn, the map σ_f extends to

$$\overline{\sigma}_f : \mathbb{H} \cup \{\mathbb{Q} \cup \{1/0\}\} \to \mathbb{H} \cup \{\mathbb{Q} \cup \{1/0\}\}.$$

Group-theoretic and analytic techniques imply that in many cases, $\overline{\sigma}_f$ has finitely many periodic cycles. Explicit examples suggest that arithmetic considerations might yield additional insights. (Received September 10, 2010)