1056-11-555 **Clayton Petsche*** (cpetsche@hunter.cuny.edu), **Lucien Szpiro** and **Thomas J. Tucker**. *A Dynamical Pairing Between Two Rational Maps.*

Given two rational maps $\varphi$ and $\psi$ on $\mathbb{P}^1$, with each map defined over a number field and having degree at least two, we study a symmetric, nonnegative-real-valued pairing $\langle \varphi, \psi \rangle$ which is closely related to the canonical height functions $h_\varphi$ and $h_\psi$ associated to these maps. Our main results show a strong connection between the value of $\langle \varphi, \psi \rangle$ and the canonical heights of points which are small with respect to at least one of the two maps $\varphi$ and $\psi$. Several necessary and sufficient conditions are given for the vanishing of $\langle \varphi, \psi \rangle$. We give an explicit upper bound on the difference between the canonical height $h_\psi$ and the standard height $h$ in terms of $\langle \sigma, \psi \rangle$, where $\sigma(x) = x^2$ denotes the squaring map. The pairing $\langle \sigma, \psi \rangle$ is computed or approximated for several families of rational maps $\psi$. (Received September 12, 2009)