RECOMPOSING RATIONAL FUNCTIONS

Let A be a rational function. A rational function $\widetilde{A}$ is called an *elementary transformation* of A if there exist rational functions U and V such that $A = U \circ V$ and $\widetilde{A} = V \circ U$. We say that rational functions A and B are *equivalent*, and write $A \sim B$, if there exists a chain of elementary transformations between A and B. The equivalence class $[A]$ of A is a union of conjugacy classes, and the relation $A \sim B$ can be considered as a weakened form of the classical conjugacy relation.

In the talk, we provide conditions for the finiteness of the number of conjugacy classes in $[A]$, and reduce two important problems about rational functions to describing $[A]$. The first problem is the problem of describing rational functions commuting with a given function A. The second one is the problem of describing "dynamical symmetries" of a given function A, where by dynamical symmetries we mean the group of Möbius transformations μ such that $A^{\circ k} \circ \mu = A^{\circ k}$ for some $k \geq 1$.