A FAMILY OF CUBIC RATIONAL MAPS AND MATINGS OF CUBIC POLYNOMIALS

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Abstract. We study a family of cubic branched coverings and matings of cubic polynomials of the form $g \perp\!\!\!\perp f$, with $g = g_a : z \mapsto z^3 + a$ and $f = P_i$ for $i = 1, 2, 3$ or 4. We give criteria for matability or not of critically finite g_a with each P_i. The maps $g_a \perp\!\!\!\perp P_1$ illustrate features that do not occur for matings of quadratic polynomials: they never have Levy cycles but do sometimes have Thurston obstructions.