1047-13-424   **Christopher Jacques Hillar*** (`chillar@msri.org`), 17 Gauss Way, Berkeley, CA 94120.
Rational sums of squares and applications.

Do rational certificates always exists for sum of squares problems? For instance, is every rational polynomial that is a sum of squares also a rational sum of squares (Sturmfels)? This is an especially important question given the rise of numerical and seminumerical algorithms. We discuss recent results and then propose some open problems and conjectures that arise naturally in the context of semidefinite programming and sums of squares. (Received February 03, 2009)