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Xiaoran Shi* (xs4@rice.edu), Department of Mathematics, Management Research Building, East Campus, USTC, Hefei, Anhui 230026, **Xiaohong Jia** (xhjia@cs.hku.hk), Department of Computer Science, the University of Hongkong, Pokflam Road, and **Ron Goldman** (rng@cs.rice.edu), Department of Computer Science, 6100 South Main, Rice University, Houston, TX 77251-1892. *Genus of rational space curves indicated by μ -bases.*

We provide a new technique to detect the singularities of rational space curves. Given a rational parametrization of a space curve, we first compute a μ -basis for the parametrization. From this μ -basis we generate three planar algebraic curves whose intersection points correspond to the parameters of the singularities. A new sparse resultant matrix for these three polynomials is constructed. The parameter values corresponding to the singularities are computed by applying Gaussian Elimination to this sparse resultant matrix. We will use our methods to generalize some classical results on rational planar curves to rational space curves, and we shall present several examples to illustrate our methods. (Received September 20, 2010)