MANY TORIC IDEALS GENERATED BY QUADRATIC BINOMIALS POSSESS NO QUADRATIC GRÖBNER BASES

AKIHIRO SHIKAMA

ABSTRACT. This talk is based on a joint-work with Takayuki Hibi, Kenta Nishiyama and Hidefumi Ohsugi. Let $G$ be a finite connected simple graph and $I_G$ the toric ideal of the edge ring $K[G]$ of $G$. In my talk, we introduce graphs $G$ with the property that $I_G$ is generated by quadratic binomials and $I_G$ possesses no quadratic Gröbner basis. First, we give a nontrivial infinite series of finite graphs with the above property. Second, we implement a combinatorial characterization for $I_G$ to be generated by quadratic binomials and, by means of the computer search, we classify the finite graphs $G$ with the above property, up to 8 vertices.

AKIHIRO SHIKAMA, DEPARTMENT OF PURE AND APPLIED MATHEMATICS, GRADUATE SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY, OSAKA UNIVERSITY, TOYONAKA, OSAKA 560-0043, JAPAN

E-mail address: a-shikama@cr.math.sci.osaka-u.ac.jp