Meeting: 998, Houston, Texas, SS 1A, Special Session on Graph Theory and Combinatorics

998-05-344 **Florian Luca*** (fluca@matmor.unam.mx) and **Rita Zuazua**. *Standard Noether Normalizations of the Graph Subring.*

Given a simple, connected graph G, with no loops, of vertex set $V(G) = \{1, \ldots, n\}$ and edge set $E(G)$, and a field $\mathbf{k}$ let $\mathbf{k}[G]$ be the monomial $\mathbf{k}$-subalgebra of the polynomial ring $\mathbf{k}[X_1, \ldots, X_n]$ generated by the monomials X_iX_j for $(i,j) \in E(G)$. A. Alcántar asked if under suitable conditions (like $\mathbf{k}$ being of characteristic zero and $\mathbf{k}[G]$ having Krull dimension n), there exist coefficients $a_{i,j} \in \mathbf{k}$ for $(i,j) \in E(G)$ such that the n linear forms $h_i = \sum_{(i,j)\in E(G)} a_{i,j}T_{i,j}$ in the edge-polynomial ring $\mathbf{k}[T] = \mathbf{k}[T_{i,j} \mid (i,j) \in E(G)]$ form a Noether normalization for the canonical morphism ϕ from $\mathbf{k}[T]$ to $\mathbf{k}[G]$ which maps every edge-indeterminate to the monomial given by the product of its two adjiacent vertice-indeterminates. In my talk, I will sketch a proof of the fact that the answer to this question is affirmative, even when $\mathbf{k}$ is of finite but sufficiently large characteristic (with respect to n). When $\mathbf{k}$ is of characteristic zero our approach shows that "most choices" of forms h_i of the above type for $i = 1, \ldots, n$ lead to Noether normalizations. (Received March 02, 2004)