1046-13-1207 **Kuei-Nuan Lin*** (`link@purdue.edu`), 150 N. University St., West Lafayette, IN 47907. *Diagonal ideals of determinantal rings.*

Let k be a field, $m \leq n$ positive integers, $X = (x_{ij})$ an m by n matrix of variables over k, $I_m(X)$ the ideal of $k[\{x_{ij}\}]$ generated by the maximal minors of X, and $R = k[\{x_{ij}\}]/I_m(X)$. We consider the diagonal ideal $\mathbb{D}$ of R, defined via the exact sequence

$$0 \longrightarrow \mathbb{D} \longrightarrow S = R \otimes_k R \xrightarrow{\text{mult.}} R \longrightarrow 0.$$

Recall that $\mathcal{R}(\mathbb{D}) \otimes_S k$ is the homogeneous coordinate ring of the secant variety of the determinantal variety $V(I_m(X)) \subset \mathbb{P}_k^{mn-1}$, where $\mathcal{R}(\mathbb{D})$ denotes the Rees algebra of $\mathbb{D}$. It is classically know that the secant variety is all of projective space in this case. We extend this fact by showing that $\mathbb{D}$ is an ideal of linear type, which means that the natural map from the symmetric algebra $\mathrm{Sym}(\mathbb{D})$ onto the Rees algebra $\mathcal{R}(\mathbb{D})$ is an isomorphism. (Received September 15, 2008)