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**Kuei-Nuan Lin\*** ([link@math.purdue.edu](mailto:link@math.purdue.edu)). *Rees Algebras of diagonal ideals.*

Let  $X$  be an  $m$  by  $n$  matrix of variables over a field  $k$ .  $R$  and  $S$  are rings defined by the minors of  $X$ . We consider the diagonal ideal  $\mathbb{D}$ , the kernel of the diagonal map. By the work of Simis-Ulrich, we know the defining equations of special fiber ring of  $\mathbb{D}$ . When  $R = S$ , the special fiber ring is known as a homogeneous coordinate ring of secant variety. Some of the cases show that the special fiber ring is  $k[X]$ . It is nature to ask whether  $\mathbb{D}$  is an ideal of linear type, which means that the natural map from the symmetric algebra of  $\mathbb{D}$  onto the Rees algebra of  $\mathbb{D}$  is an isomorphism. We aim at a more refined study of the ideal defining Rees algebra of  $\mathbb{D}$ . By knowing the defining equations, we can show that Rees algebra is Cohen-Macaulay and  $\mathbb{D}$  is an ideal of linear type. (Received September 06, 2009)