Osculating Varieties of Veronese Varieties and Their Higher Secant Varieties

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Abstract. We consider the $k$-osculating varieties $O_{k,n,d}$ to the (Veronese) $d$-uple embeddings of $P^n$. We study the dimension of their higher secant varieties via inverse systems (apolarity). By associating certain 0-dimensional schemes $Y \subset P^n$ to $O_{k,n,d}$ and by studying their Hilbert functions, we are able, in several cases, to determine whether those secant varieties are defective or not.

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