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ON THE DUALS OF SMOOTH PROJECTIVE COMPLEX HYPERSURFACES

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Abstract: We first show that a generic hypersurface V of degree $d \geq 3$ in the projective complex space $\mathbb{P}^n$ of dimension $n \geq 3$ has at least one hyperplane section $V \cap H$ containing exactly n ordinary double points, alias A_1 singularities, in general position, and no other singularities. Equivalently, the dual hypersurface $V^\vee$ has at least one normal crossing singularity of multiplicity n. Using this result, we show that the dual of any smooth hypersurface with $n, d \geq 3$ has at least a very singular point q, in particular a point q of multiplicity $\geq n$.

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Key words: hypersurface, dual hypersurface, Lefschetz properties, hyperplane section, singularities.