

[Ohno, Masahiro](#)

On odd dimensional projective manifolds with smallest secant varieties. (English)

[Zbl 0887.14029](#)

[Math. Z. 226, No. 3, 483-498 \(1997\).](#)

Let X be an n -dimensional nondegenerate projective manifold X in \mathbb{P}^N over an algebraically closed field k of characteristic 0, and $\text{Sec}X$ the secant variety of X in \mathbb{P}^N . It is well known that if $\text{Sec}X \neq \mathbb{P}^N$ then $\dim \text{Sec}X \geq (3n+2)/2$, that if the equality holds then X is called a Severi variety, and that Severi varieties are completely classified. In this article, we consider the case when $\text{Sec}X \neq \mathbb{P}^N$, n is odd, $n \geq 3$, and $\dim \text{Sec}X = (3n+3)/2$, and show that the possible values of dimension of the contact locus of $\text{Sec}X$ with its general embedded tangent space are $(n+1)/2$ or $(n+5)/2$, and that if the general contact locus has dimension $(n+1)/2$, then X is a Fano manifold and the possible values of n are 3, 5, 7, 15 (in these cases there are examples), $2^m - 1$ ($m \geq 7$), or $2^m \cdot 3 - 1$ ($m \geq 5$) (in these cases no examples are known). We also determine the manifold $X \subset \mathbb{P}^N$ when $n = 5$ or $n = 7$ and the general contact locus of $\text{Sec}X$ has dimension $(n+1)/2$.

Reviewer: [M.Ohno \(Tokyo\)](#)

MSC:

[14N05](#) Projective techniques in algebraic geometry
[14J40](#) n -folds ($n > 4$)

Cited in 4 Documents

Keywords:

[Severi variety](#); [secant variety](#)

Full Text: [DOI](#)