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# On Interposition in Manifolds

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Let $M$ be a $C^\infty$-manifold, $\dim(M)=m$, $N$ a regular neat submanifold of $M$, $\dim(N)=n<m-1$.

**Definition** We say that $(M, N)$ can be interposed by a $k$-dimensional submanifold $M'$ if there exists a $k$-dimensional submanifold $M'$ of $M$ such that $N\subset M'$.

We have the following:

**Theorem** $(M, N)$ can be interposed by a two-side $(m-1)$-dimensional submanifold iff there exists a section which is nonwhere zero on the normal vector bundle of $N$ in $M$.

**Corollary 1** If there exist $k$ sections which are independant on the normal vector bundle of $N$ in $M(k<m-n)$, then there are $k+2$ manifolds

$$N=M_{m-k-1}\subset M_{m-k}\subset\cdots\subset M_{m-1}\subset M_m=M$$

such that for $m-k-1\leqslant j<l<i\leqslant m$, $(M_i, M_j)$ can be interposed by $M_l$.

**Corollary 2** If there exist $(m-n-1)$ sections which are independant on the normal vector bundle of $N$ in $M$, then any $C^r$-triangulation of $N$ may be extended to a $C^r$-triangulation of $M$.

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