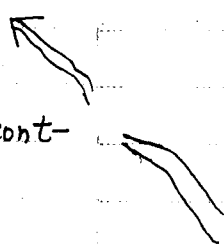


points of intersection would be singular points of  $H \cap V$ , and so this can not happen.  $\square$  O.K. see P21  $\square$

To prove the assertion in the general case requires a different approach. We argue as follows: let  $p \in V$  be any smooth point, and let  $\mathbb{P}^{n-2} \subset \mathbb{P}^n$  be an  $(n-2)$ -plane meeting  $V$  transversely at  $p$ ; let  $Z$  be the irreducible component of  $V \cap \mathbb{P}^{n-2}$  containing  $p$ . Now consider the pencil  $\{H_\lambda\}$  of hyperplanes in  $\mathbb{P}^n$  containing  $\mathbb{P}^{n-2}$ .

$\square$  If  $H$  is a hyperplane containing  $\mathbb{P}^{n-2}$ ,  $H$  can be expressed as  $\langle e_0, \dots, e_{n-2}, ae_{n-1} + be_n \rangle$  where  $e_0, \dots, e_n$  are orthonormal basis for  $\mathbb{C}^{n+1}$  and  $|a|^2 + |b|^2 = 1$ .  $\square$

Each hyperplane section  $H_\lambda \cap V$  of  $V$  contains  $Z$ , but since each  $H_\lambda$  intersects  $V$  transversely at  $p$ ,  $p$  — being a smooth point of  $H_\lambda \cap V$  — can lie on at most one of the irreducible components of  $H_\lambda \cap V$  for each  $\lambda$ .

$\square$  I think  $Z$  is the connected component of  $(V \cap \mathbb{P}^{n-2})^*$  containing  $p$ .  $\Rightarrow Z$  is open in  $V \cap \mathbb{P}^{n-2}$ . see P21 Proposition. 

Since  $\mathbb{P}^{n-2}$  meets  $V$  transversely at  $p$ , each  $H_\lambda$  containing  $\mathbb{P}^{n-2}$  meets  $V$  transversely at  $p$ .

To show that  $p$  is a smooth point of  $H_\lambda \cap V$ , we will show that

$$\begin{pmatrix} \nabla F_1 \\ \vdots \\ \nabla F_{n-k} \\ 0, 0, \dots, 1 \end{pmatrix} \text{ has rank } n-k+1, \text{ where } V = \{F_1 = F_2 = \dots = F_{n-k} = 0\}.$$

$$= 0\}. \quad H_\lambda = \{X_n = 0\}.$$