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Kwai-Man Fan* (kmfan@math.ccu.edu.tw), Department of Mathematics, National Chung Cheng University, 621 Minghsiang, Chiayi, Taiwan. *Deformations of complexified real arrangements.*

Let Σ be an arrangement of n complex projective lines in CP^2 . In this work, we use deformation method to study the relationship between the incidence lattice and the isotopy type of $\Sigma \subset CP^2$. First, we show that for $n \leq 8$, the isotopy type of $\Sigma \subset CP^2$ is determined by the incidence lattice of Σ . As a consequence, for an arrangement with $n \leq 8$ lines, the incidence lattice of Σ determines the topological type of $CP^2 \setminus \Sigma$. The fact that when $n = 7, 8$, the incidence lattice of a complexified real arrangement Σ determines the fundamental group $\pi_1(CP^2 \setminus \Sigma)$ was first obtained by Garber, Teicher, and Vishne at 2001. Some part of their calculations were done by computers. In this work, as a consequence, we obtain a proof of this result that involves no computer calculations. Next, we apply this method to study isotopy types of complexified real arrangements of nine lines in the plane. Also, we use the same method to obtain combinatorial conditions on the incidence lattice that will determine the isotopy type of the arrangement of lines. (Received January 16, 2003)