Real and complex analytic sets. The relevance of Segre varieties

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Abstract. Let $X \subset \mathbb{C}^n$ be a closed real-analytic subset and put

$$\mathcal{A} := \{z \in X \mid \exists\, A \subset X,\ \text{germ of a complex-analytic set},\ z \in A,\ \dim_z A > 0\}$$

This article deals with the question of the structure of $\mathcal{A}$. In the main result a natural proof is given for the fact, that $\mathcal{A}$ always is closed. As a main tool an interesting relation between complex analytic subsets of X of positive dimension and the Segre varieties of X is proved and exploited.