In this talk I will present a generalization of the non-linear Convexity Theorem of Kostant to semisimple symmetric spaces. Let G be a connected semisimple real Lie group, with finite center. Denote by θ a Cartan involution on G and by σ an involution on G that commutes with θ.

We fix the notation $K := G^\theta$ and $H < G^\sigma$, i.e. H is an open subgroup of the fixed point set G^σ. Let P be a minimal parabolic subgroup of G and $G = KAN_P$ the associated Iwasawa decomposition of G. The non-linear Convexity Theorem of Kostant says that for $a \in A$

$$\mathfrak{H}_P(aK) = \mathrm{conv}(W_K . \log a).$$

Here $\mathfrak{H}_P$ denotes the Iwasawa projection determined by P, "conv" denotes the convex hull and W_K denotes the Weyl group.

We will show that this theorem can be generalized to the setting of semisimple symmetric spaces G/H. Namely, for $a \in A$

$$\mathfrak{H}_P(aH) = \mathrm{conv}(W_{K\cap H} . \log a) + \Gamma(P),$$

where $\Gamma(P)$ is a convex cone depending on P and $W_{K\cap H}$ denotes the Weyl group of $K \cap H$.