The key element of adaptive spatial filtering is the identification of statistically homogenous pixels (SHP). Let $A_p$ be the amplitudes of pixel $p$:

$$A_p = [A_1(p), A_2(p), \ldots, A_M(p)]$$

(1)

where $M$ is the number of SAR images. Let $A_q$ be the amplitudes of pixel $q$ located in the estimation window centered on $p$, and $A_q = [A_1(q), A_2(q), \ldots, A_M(q)]$. We can use statistical hypothesis testing to evaluate whether $p$ and $q$ are SHP (Samiei-Esfahany 2017):

$$H_0 : F_{A_p} = F_{A_q}, \quad H_1 : F_{A_p} \neq F_{A_q}$$

(2)

where $F_{A_p}$ and $F_{A_q}$ are the cumulative distribution function of amplitudes of $p$ and $q$, respectively. In this paper, the Kolmogorov-Smirnov (KS) test is used to identify the SHP in a rectangular window with dimensions of $19 \times 13$ (azimuth $\times$ range). The adaptive spatial filtering will be carried only if the number of SHP is more than 18 by which to preserve PS information.