ABSTRACT. In this work, a spectral based method, the azimuth cut-off ($\lambda c$) approach is investigated, improved and studied under extreme weather conditions, i.e.; tropical cyclones. In particular, all the $\lambda c$-dependent parameters are analyzed and set to make the estimates independent from the sensor and the scene.

1. INTRODUCTION
In this study, the azimuth cut-off ($\lambda c$) method is analyzed under high wind regimes. Firstly, the importance of the pixel spacing, the box size and the image texture in terms of homogeneities are discussed. The objective of the work is to make the $\lambda c$ estimation independent from the scene and the sensor.

2. METHODS
The SAR image is divided into SAR imagette of 1 km x 1 km;
• The autocorrelation function (ACF) of each imagette is evaluated,
• A 100-110 m median filter window is applied;
• The best Gaussian fit is retrieved;
• The $\lambda c$ value is estimated;

3. EXPERIMENTS
$\lambda c = a + bU_{10}$

The test is conducted over 355 Sentinel-1 images in StripMap mode with 10 m pixel spacing. Interpolated ECMWF wind speed output to the SAR acquisition time and location is used to verify the effectiveness of the $\chi^2$-based filter.

4. RESULTS

5. CONCLUSION
$\chi^2$-based method plays a key role in filtering out unreliable $\lambda c$ estimations. The novel approach seems to work well in extreme cases.