Icebergs can be a hazard for navigation in Polar Regions, but they are also important in our understanding of how global warming impacts our planet today. By applying automatic detection algorithms to Synthetic Aperture Radar (SAR) images we can obtain a huge amount of information regarding location of icebergs, their size and distribution. We can also evaluate how these factors changed over the decades.

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A good algorithm should...
- Be fast
- Have a low false alarm rate
- Detect all icebergs

HV-DePolRAD – filter

\[ \langle I \rangle = \frac{|HV|_{test}^2 - |HV|_{train}^2}{|HH|_{train}^2} \]

HV and HH are polarizations, train and test are two different windows where the background is calculated.

A comparison between the K-, Generalized Gamma-, and Exponential distribution

The K-distribution

\[ f(x) = \frac{2}{x} \left( \frac{Lx}{\mu} \right)^{\frac{L+1}{2}} \frac{1}{\Gamma(L)\Gamma\left(\frac{L}{2}\right)} K_{L-1} \left( 2 \left( \frac{Lx}{\mu} \right)^{\frac{1}{2}} \right) \]

The Generalized Gamma distribution

\[ f(x) = \frac{|L|}{\Gamma(k)} x^{k-1} e^{-\frac{L}{x}} \]

The exponential distribution

\[ f(x) = \lambda e^{-\lambda x} \]

The threshold, \( T \), is calculated from a given probability of false alarm, \( P_f \), such that

\[ P_f = \int_{T}^{\infty} f(x)dx = 1 - F(T) = 1 - \int_{0}^{T} f(x)dx \]

For further explanations about the symbols, please ask me.

From the graph it can be assumed that the K-distribution fits the real data the best. However, we would have to verify this result by applying statistical tests, such as the Kolmogorov-Smirnov or Chi-Squared Goodness of Fit tests, before drawing any conclusions. Regarding computation time the exponential distribution is the fastest, but due to a high rate of false alarms other distributions may be better.