

# Ship Wake Detection in SAR Imagery

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33.9m containers  
2<sup>nd</sup> busiest port

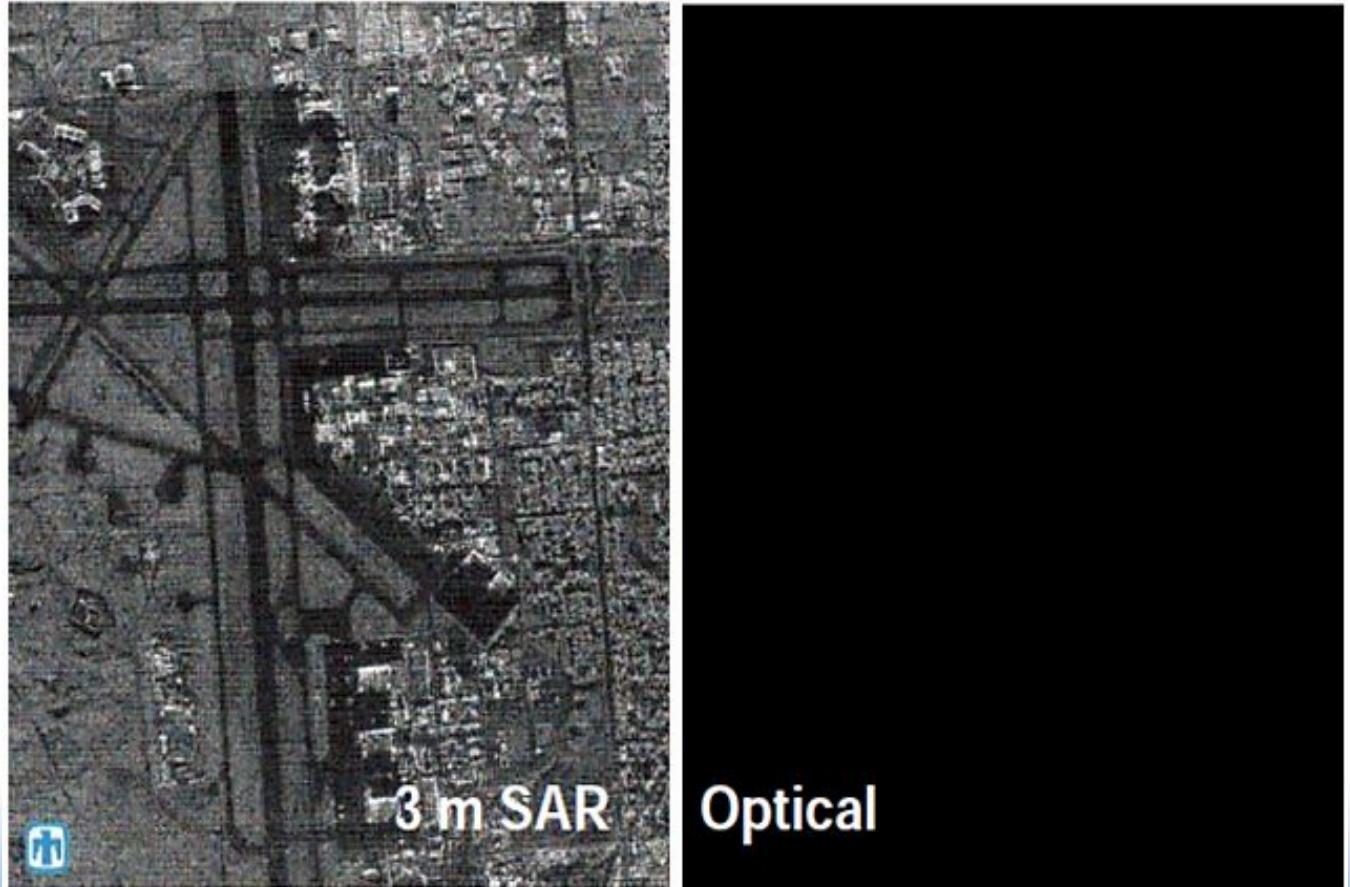
Singh, Malminderjit. "Port of Singapore Posts 4% Rise in Container Throughput." *The Business Times*.

# Ship Wakes

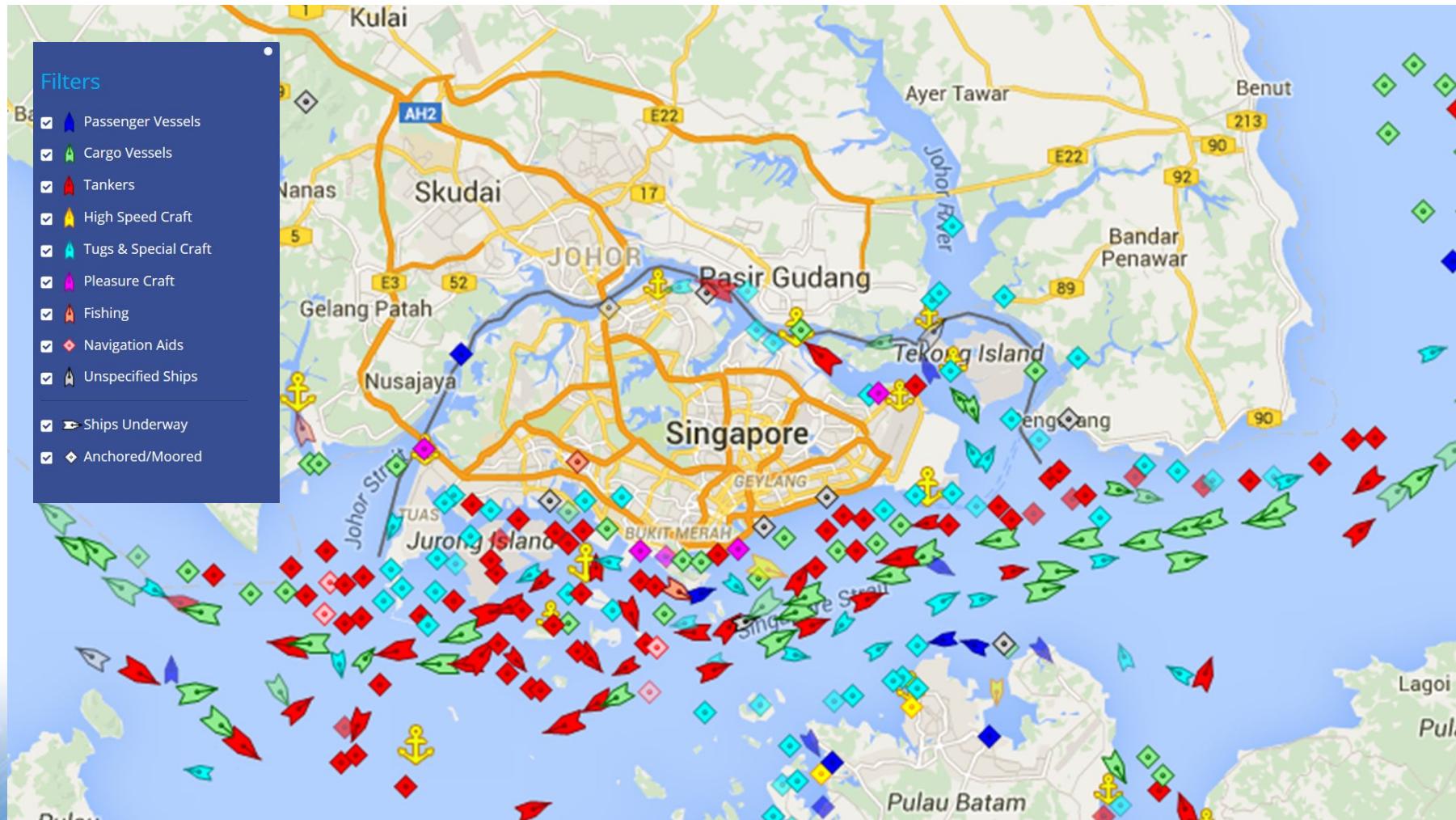


# SAR Advantage

All Weather  
Day/Night



# Automatic Identification System (AIS)

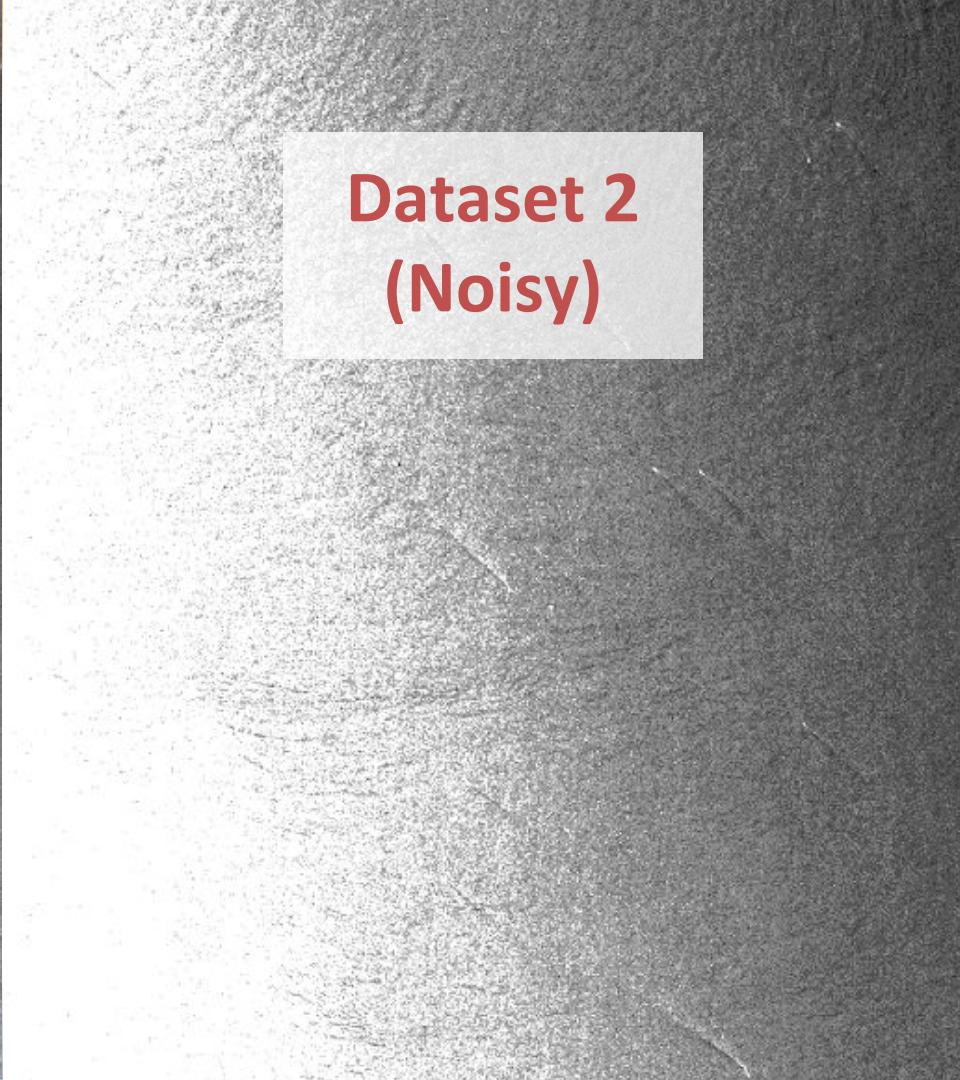




TerraSAR-X 3.01m resolution

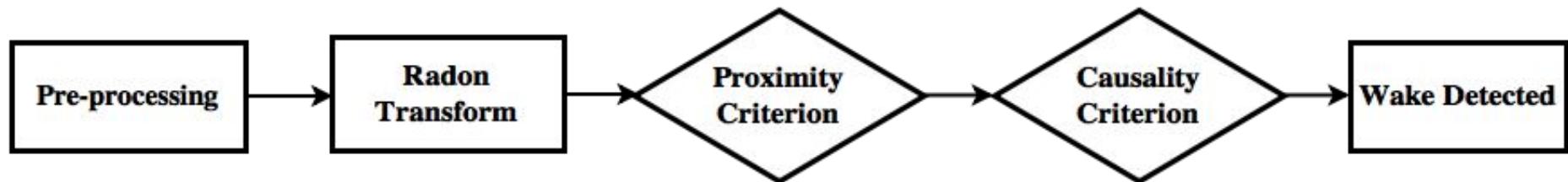


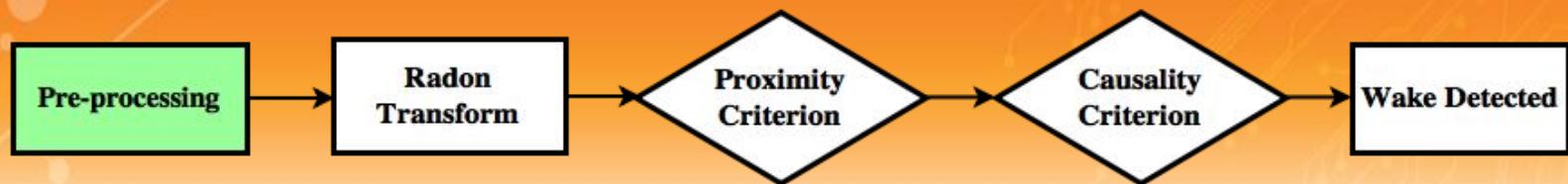
**Dataset 1  
(Clean)**



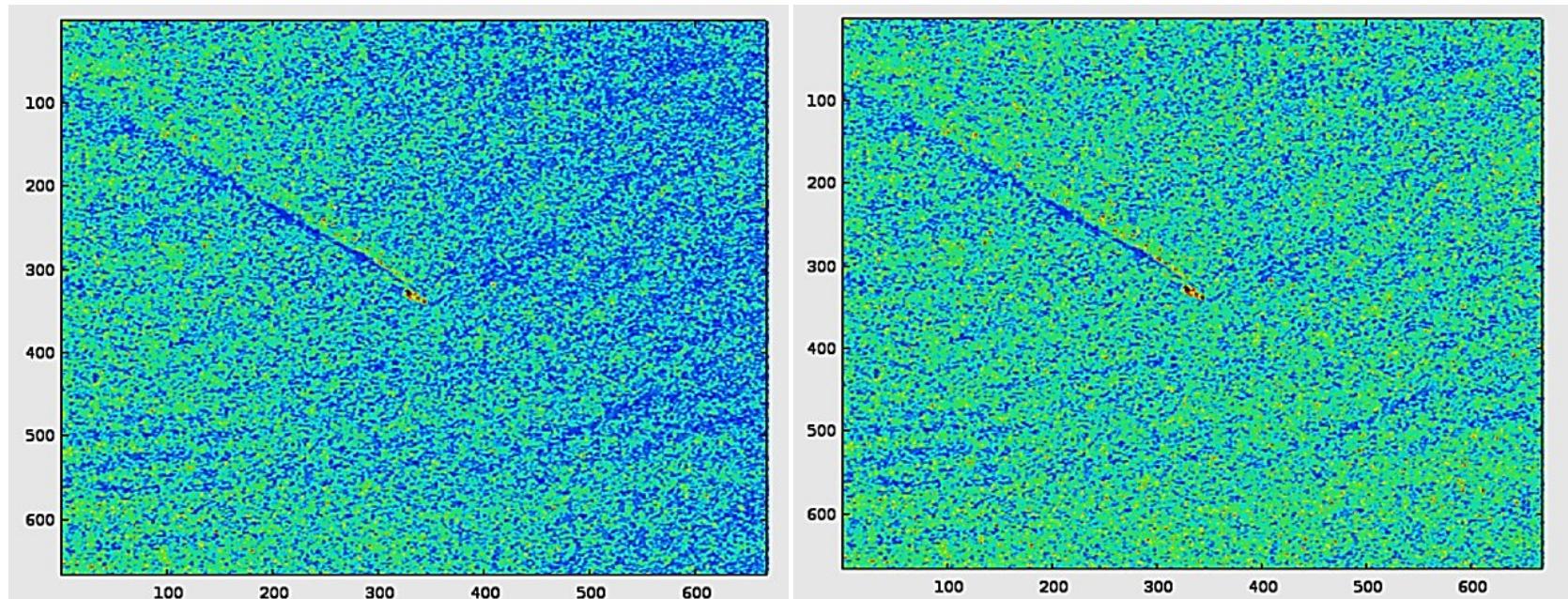
**Dataset 2  
(Noisy)**

# Methodology



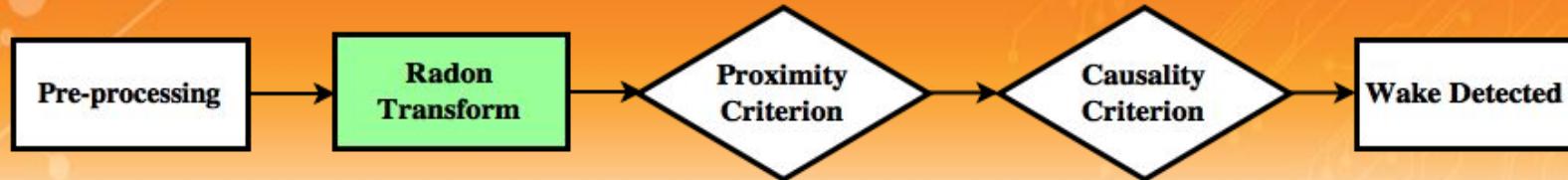


# PRE-PROCESSING



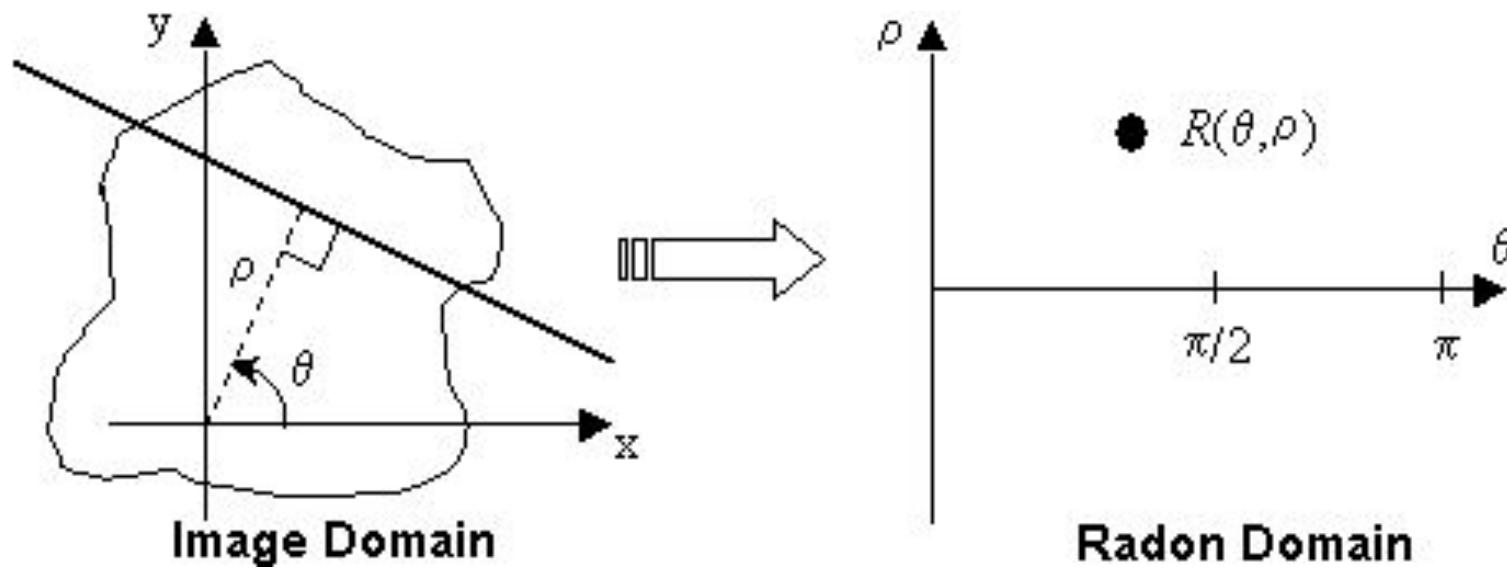
Before

After



# Radon Transform

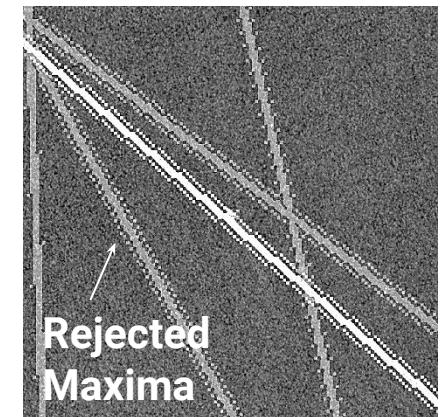
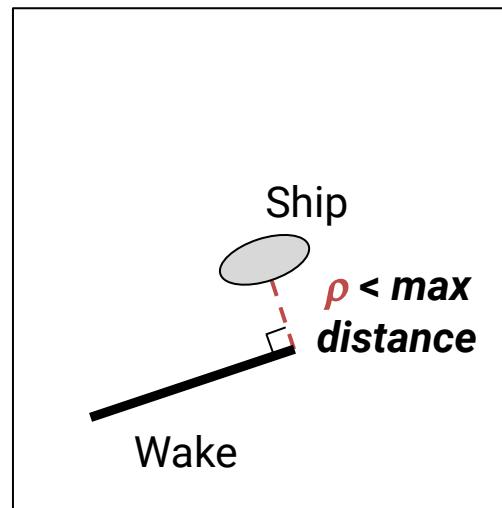
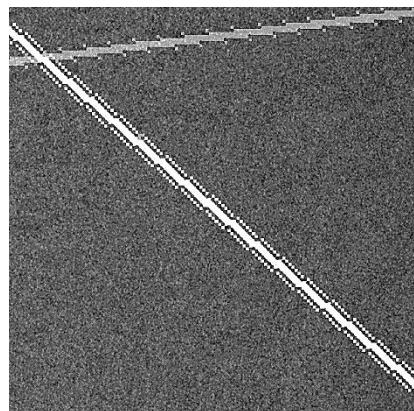
## to detect wake as linear features



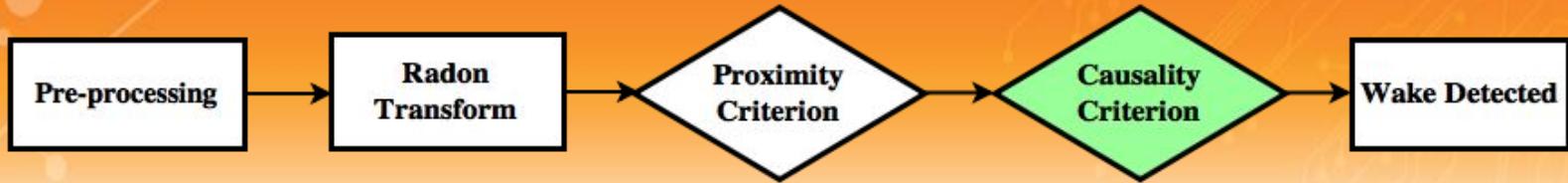


# 1. Proximity Criterion

## Wake Displacement

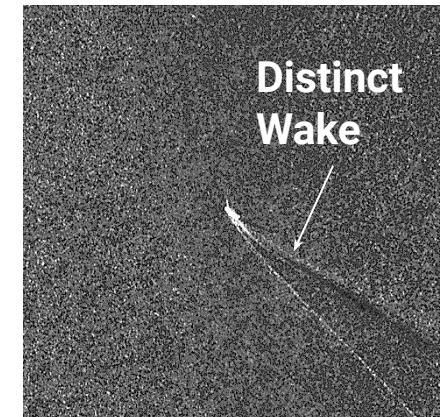
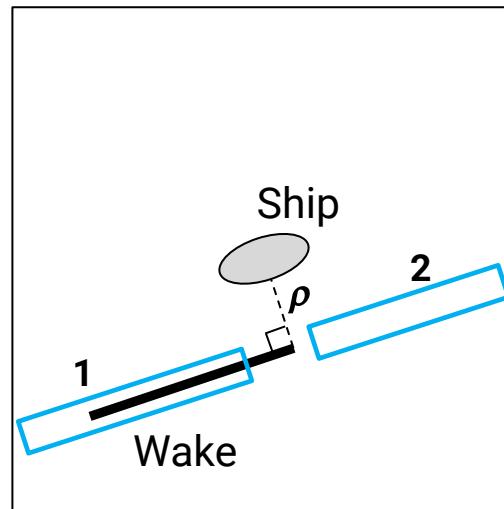
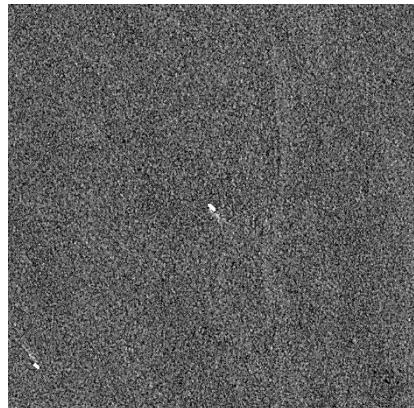


Low  $N$  ← → High  $N$

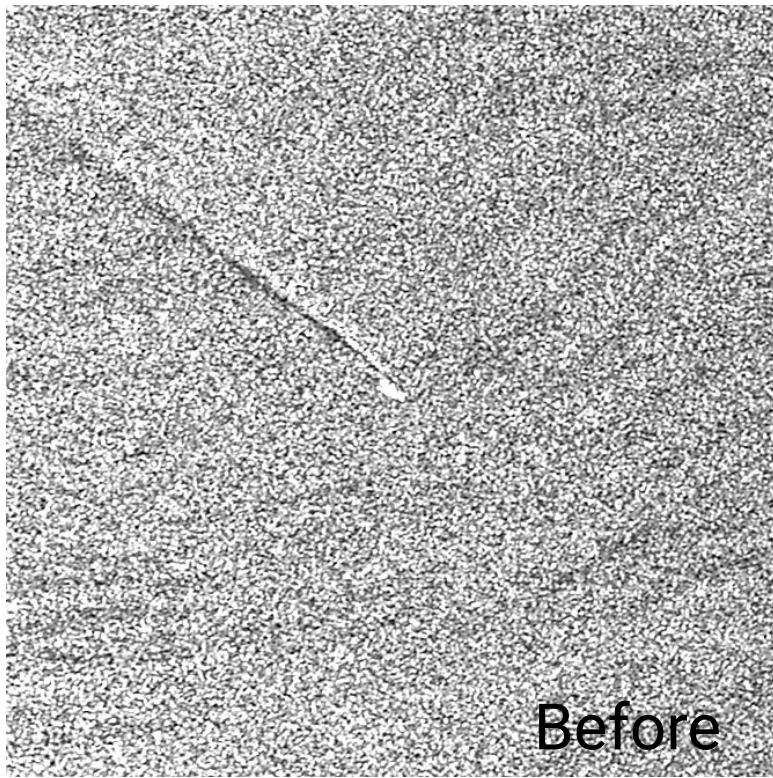
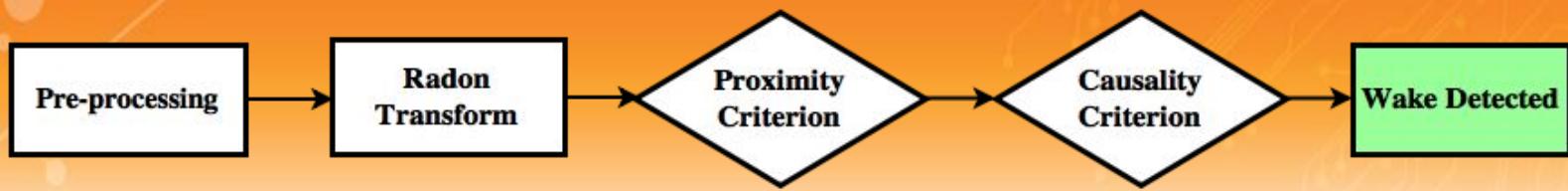


## 2. Causality Criterion

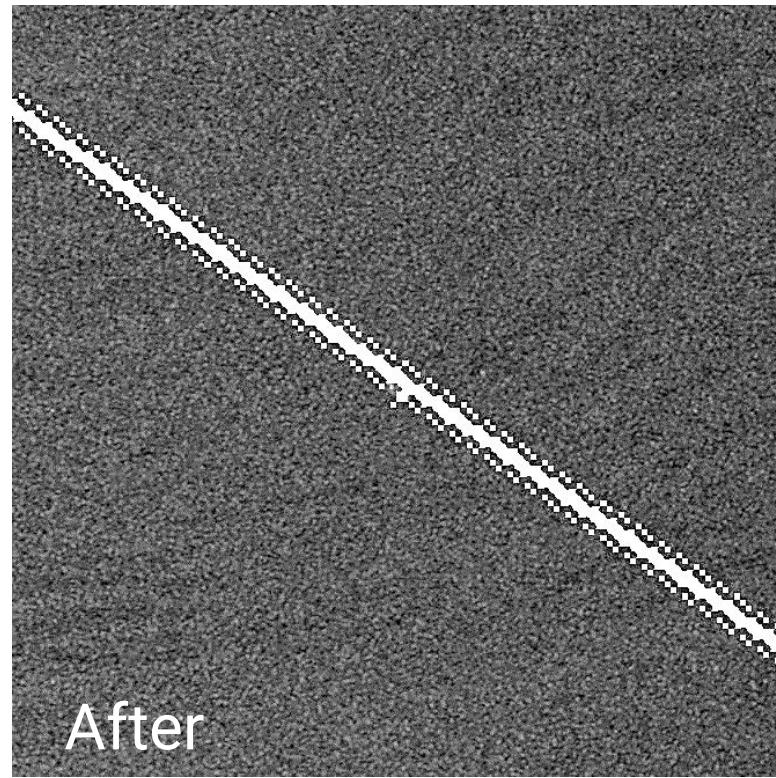
### Wake Distribution



Low  $K$  ← → High  $K$



Before



After





**Thank you!**