High Voltage Power Line Change Detection by Time Series SAR Image

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ABSTRACT:

Due to the fast economy developing and the natural resource distribution, China state Grid Company has to build ultra high voltage power transmission lines (500Kv) and extra high voltage power transmission lines(>500Kv) to balance the power resource from west to east. The longest power transmission lines will be establishing in the near future in China. By which, the “clean” power will be able to be transferred thousands of miles. Comparing with high-speed railway, this infrastruction turned to be the second biggest project in China and a leading project of power transmission in the world. The whole line length of this project will be 10 thousand kilometers. How to monitor the whole grid and report the potential disaster turn to be a great challenge. By the cooperation between Wuhan University and State Grid Electric Power Research Institute, some pilot studies had been done along the line of 1000Kv power line in Hubei Province. TerraSAR high resolution (HR) SAR images had been collected from this research. It shows that though power lines only have 2~3 centimeter wide in diameter but they may give strong reflection in 3m resolution strip mode SAR images in special geometry. This paper comparing the power line reflection pattern and size, more information such as line orientation, length, diameters have been taken into account. Time series TerraSAR image (more than 10 images) have been collected to do the further analyze. The potential of using SAR images to detect power line swing and suspending will be tested by these SAR data sets.