

### Dunes: A Synthetic Aperture Radar (SAR) View

Dan G. Blumberg and Ronald Greeley

Department of Geology

Arizona State University

Tempe, Arizona 85287-1404

e-mail address: [Blumberg@ASUIP2.DNET.NASA.GOV](mailto:Blumberg@ASUIP2.DNET.NASA.GOV)

Synthetic Aperture Radar (SAR) provides a unique perspective of Earth's surface and processes involved in its formation. Features formed by windblown sand and dust are abundant in deserts and are sensitive to climate and climate change. The JPL SAR (AIRSAR) was used to study surfaces in the Mojave. Results show that SAR provide information both on form and process as they pertain to windblown sand. High resolution SAR images can decipher dune types (i.e., star, linear, transverse dunes, etc.), and can provide an indication of surface roughness -- a key parameter in modeling aeolian activity.

We show SAR signatures of dune types including: linear, transverse, and star dunes. The star dunes are easiest to identify in radar images due to a distinct blooming signature. Linear and transverse dunes can be identified due to their speckle return and dark interdunal surface. Interestingly, we noticed in radar images of the Stovepipe Wells dune field that even when the illumination is parallel to the crest of the dunes they are visible.

Generally, calibrated SAR data can provide a useful tool in studying dryland environments. The anticipated launches of the Shuttle Radar Laboratory (SRL) will provide many scenes of wind swept regions on Earth. We anticipate that we will show some results from the SRL mission.

KEY WORDS : SAR, Geological Remote Sensing, Earthquake, Integration