

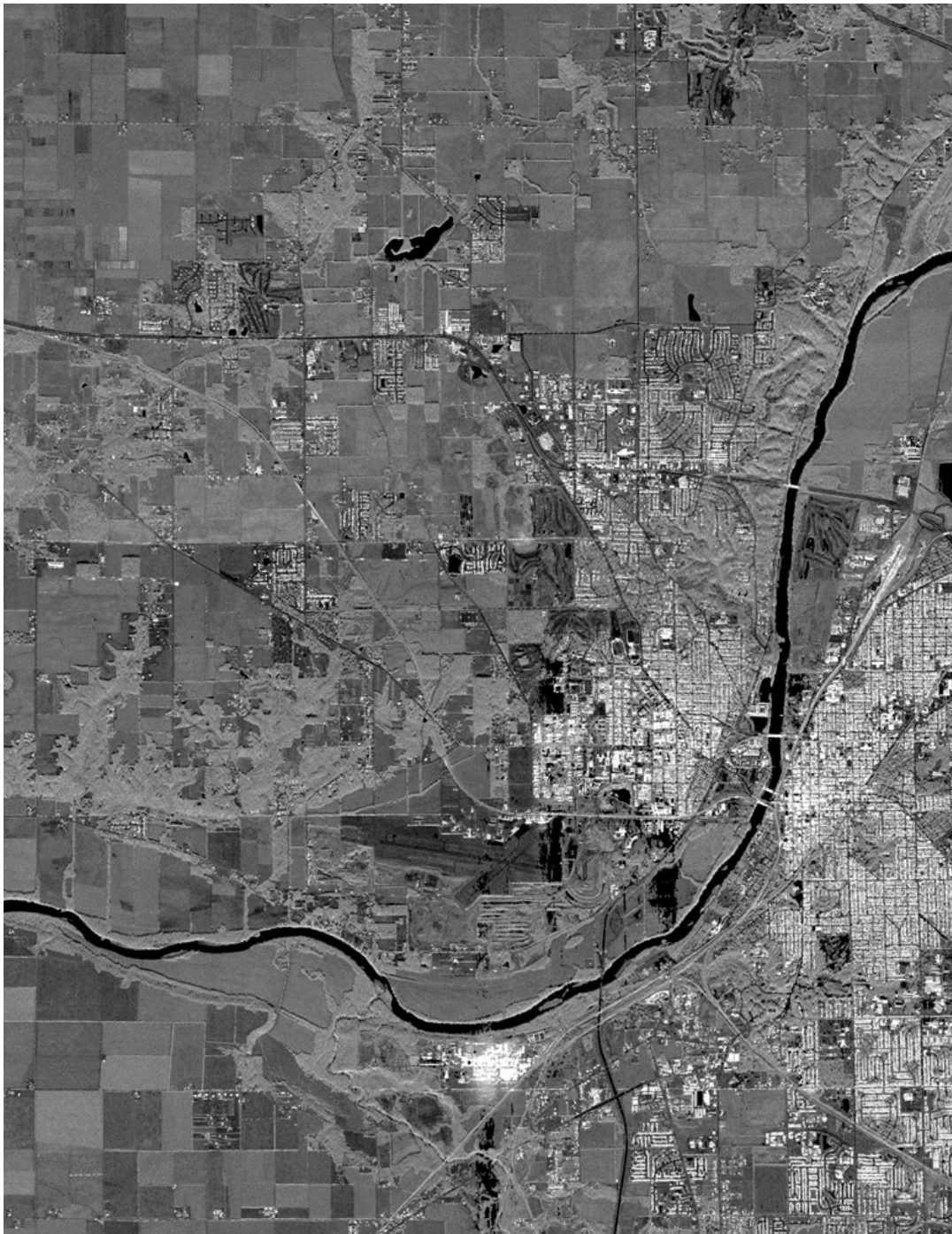


Perils of E/O satellite image collection: CLOUDS. You have to image on the satellite schedule rather than your own. Can partially compensate by accepting views with large tilt – but that can make operations like change detection difficult. This is one image of a stereo pair collected by OrbView 3 at nominally 1 meter GSD. Its fine as long as your area of interest is not under one of the clouds.









Airborne SAR – collected between 2-4 am on a cloudy night. Commercial SAR satellites available but spatial resolutions so far have been low (ERS1: 12m) Radarsat 2 may have 1-2 meter mode.

Comparison of approximately same area with passive, E/O, panchromatic on the left and Ku-band SAR on the right. Note differences in gray level response, speckle, and bright returns from dihedral / trihedral objects.

E/O Orbview 3

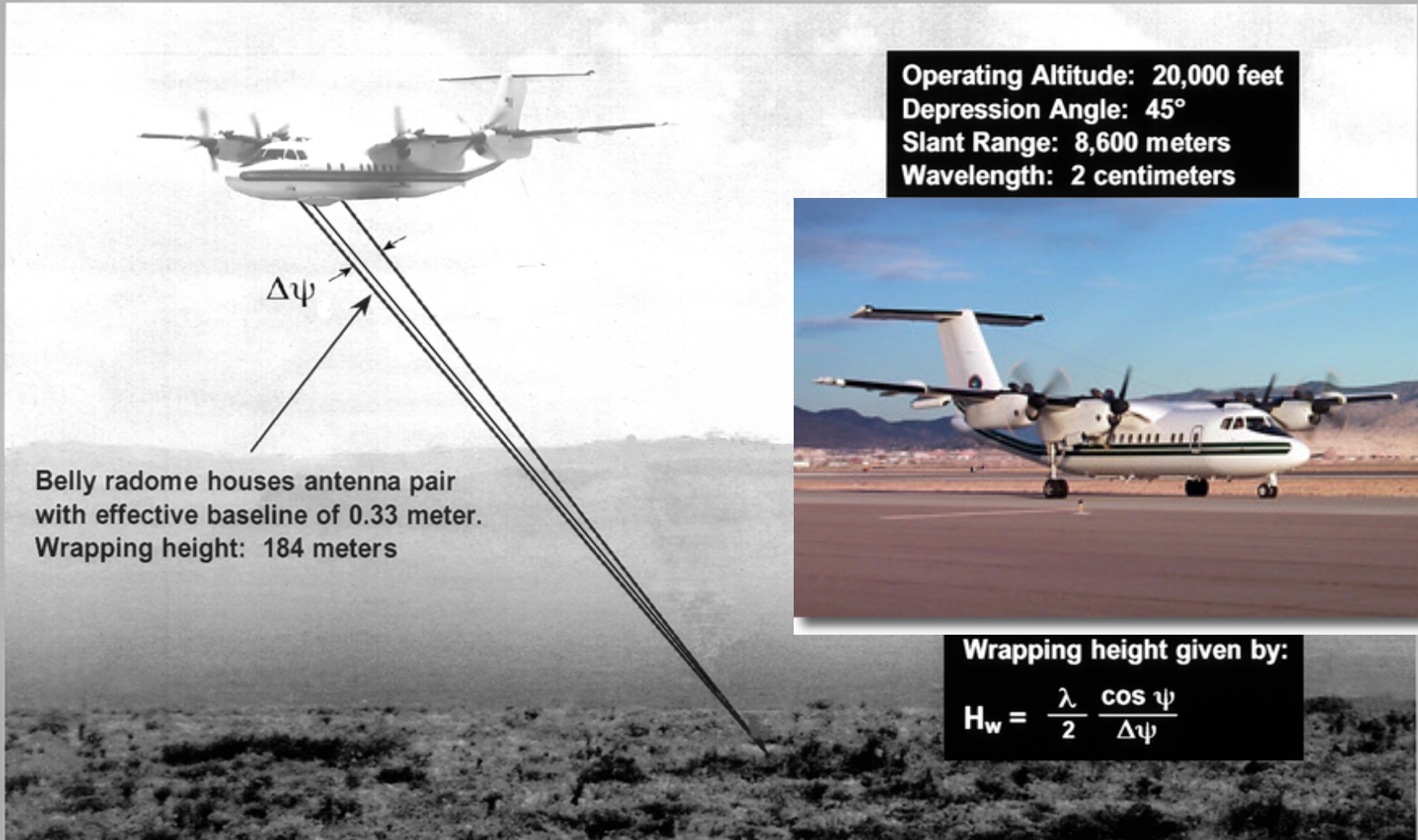


RTV Airborne SAR

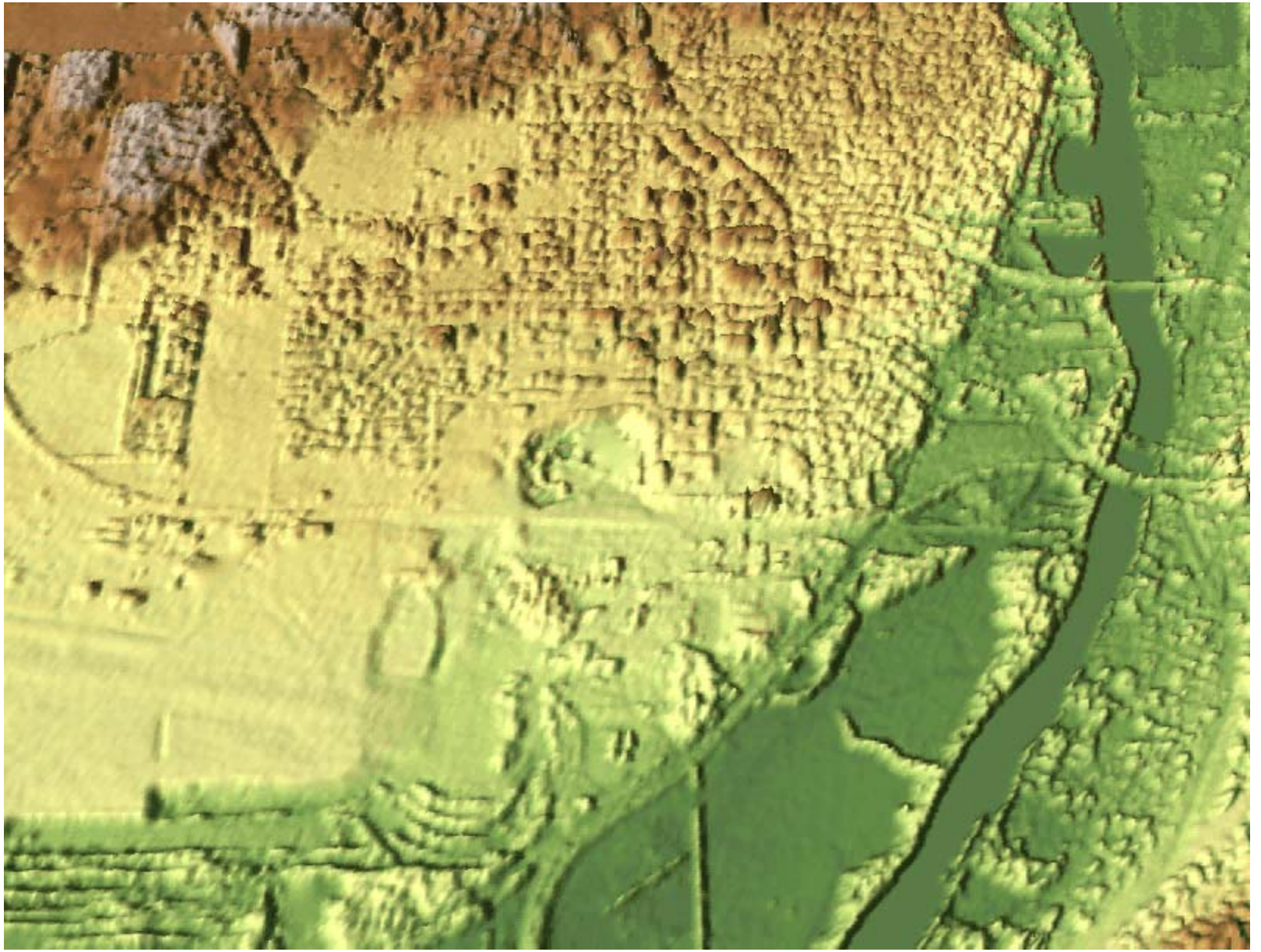


Rapid Terrain Visualization Airborne IFSAR System

RTV Multiple Phase Center IFSAR Concept

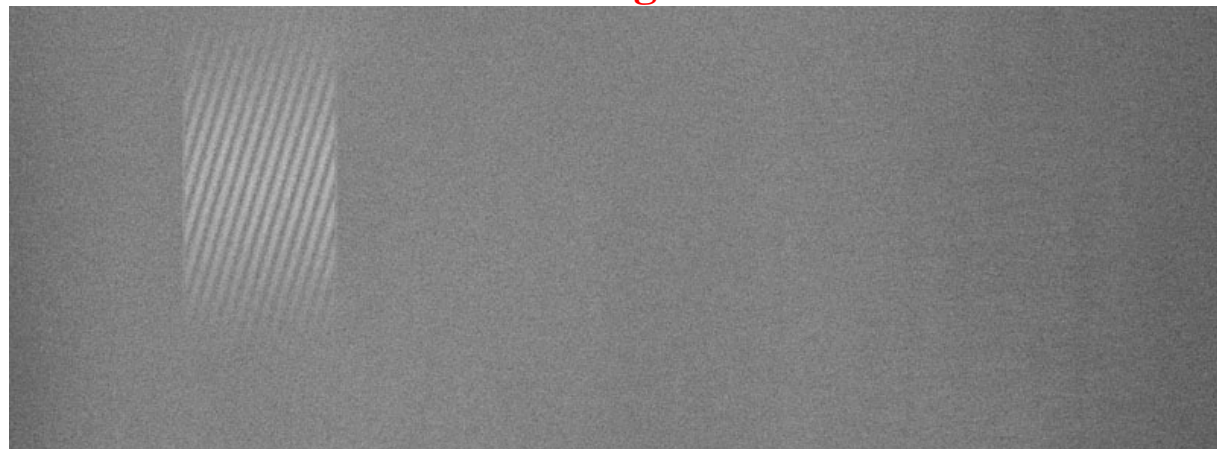




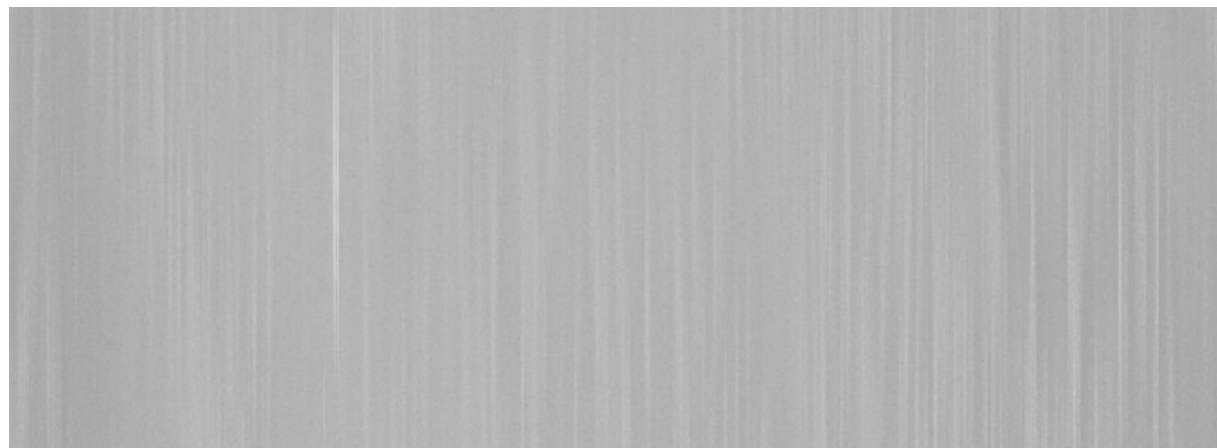


Range

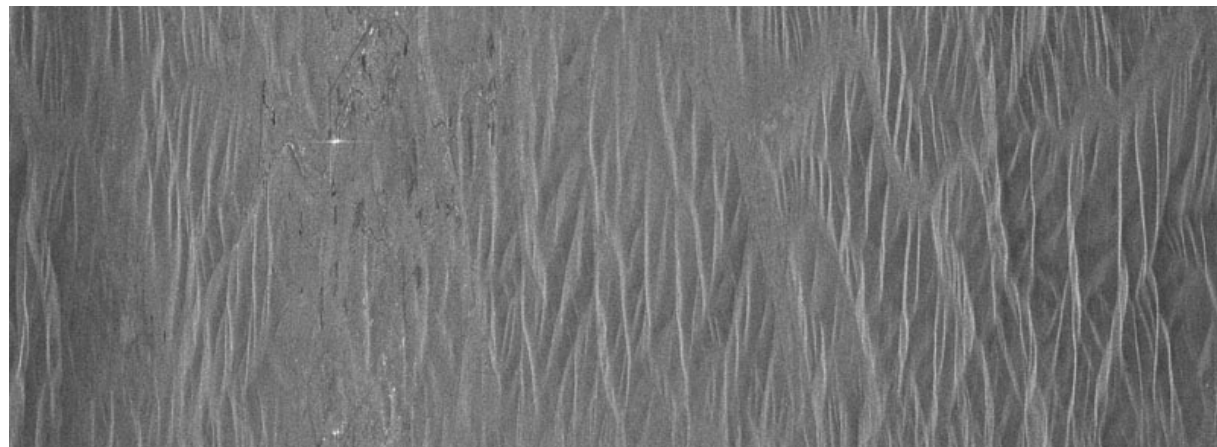
Azimuth



Raw Data

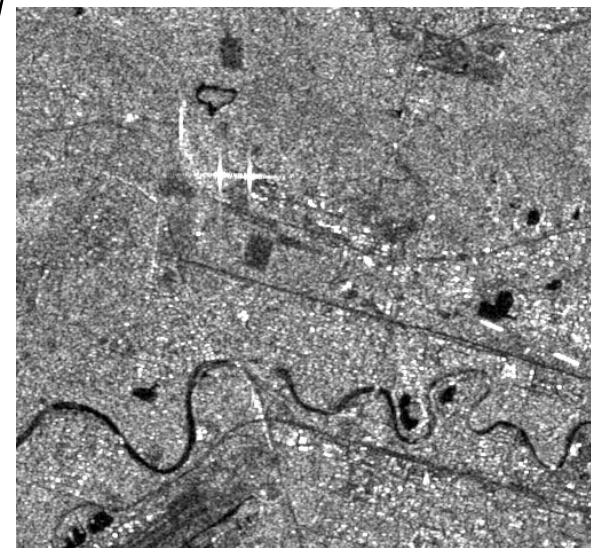


Range Compressed Data



Range Compressed and
Azimuth Compressed
(Focused) Data

2 prominent scatterers



ERS-2

Scene includes
Fairbanks, AK
processed to approx.
12m pixel (RS2 will
have 3m strip mode and
1m spotlight mode)

ASF produced image

W 8384 x H 8193

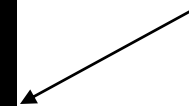
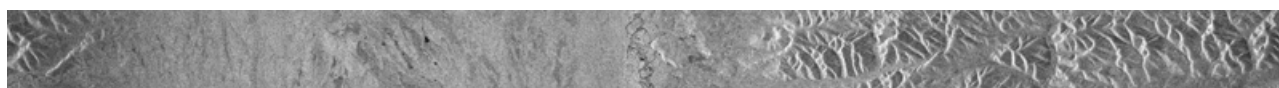
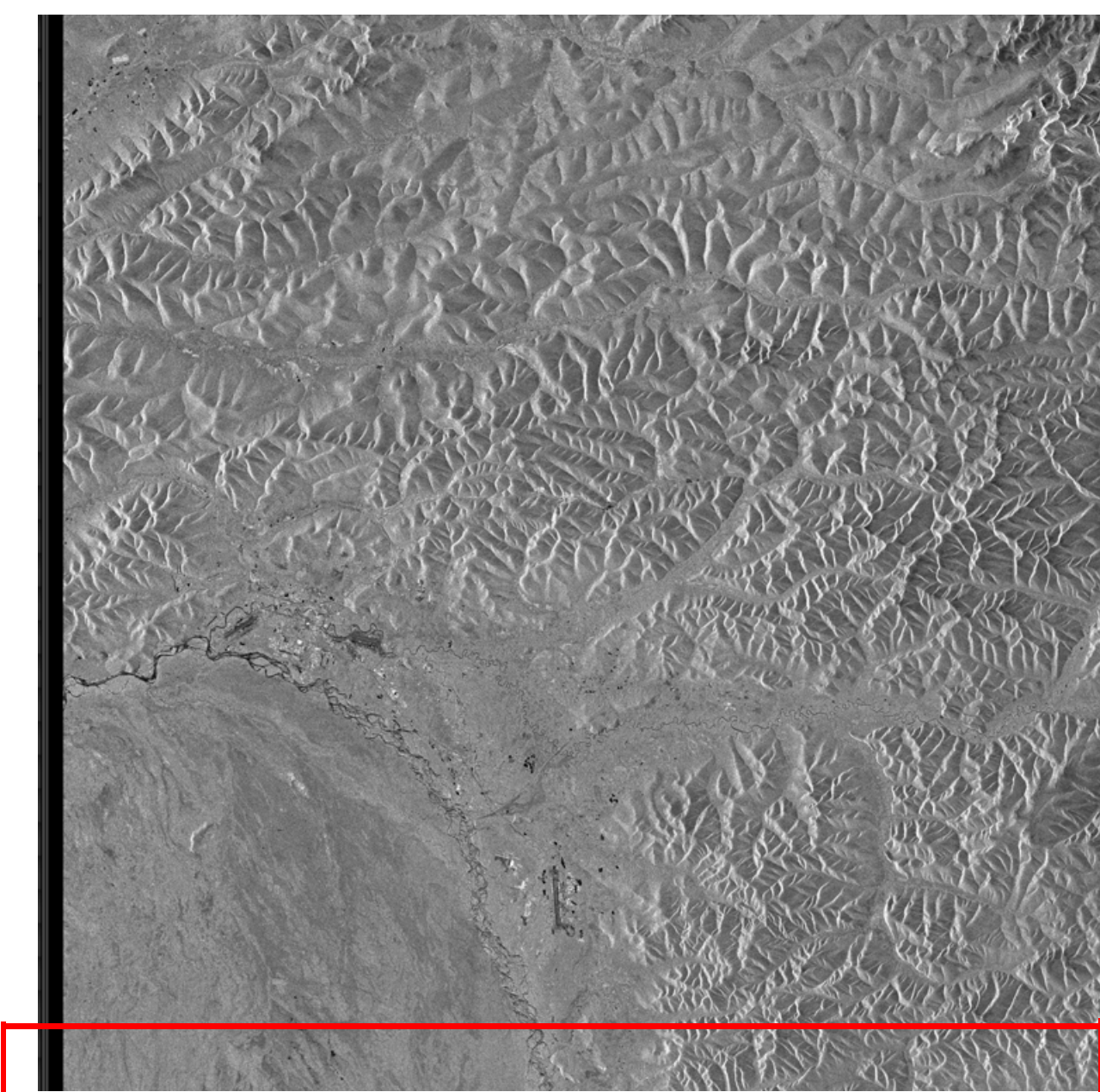


Image from first 2048
lines of Lev0 IQ data &
algorithm of Sandwell
of WINSAR consortium.
27,631 pulses in file,
5616 samples per pulse,
321,735,365 b. in file, 5
bits per sample



ASF image

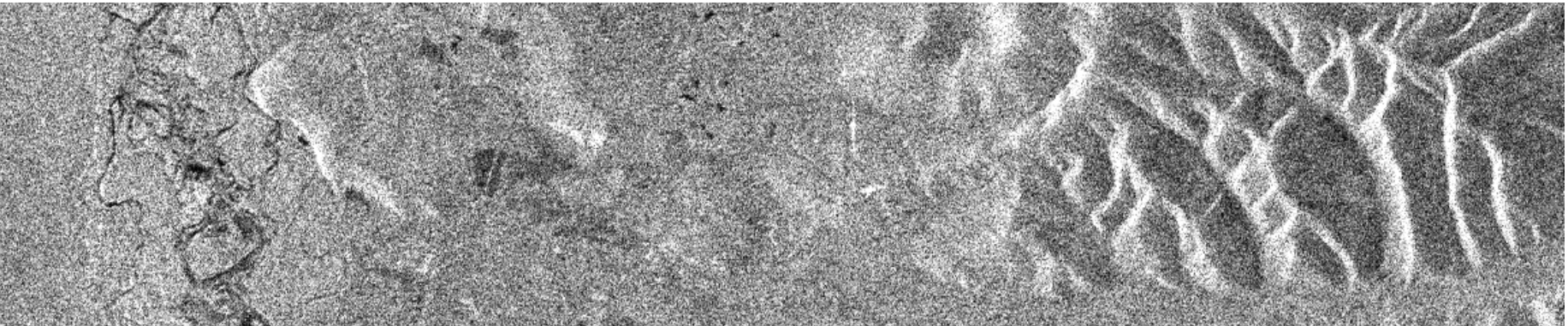
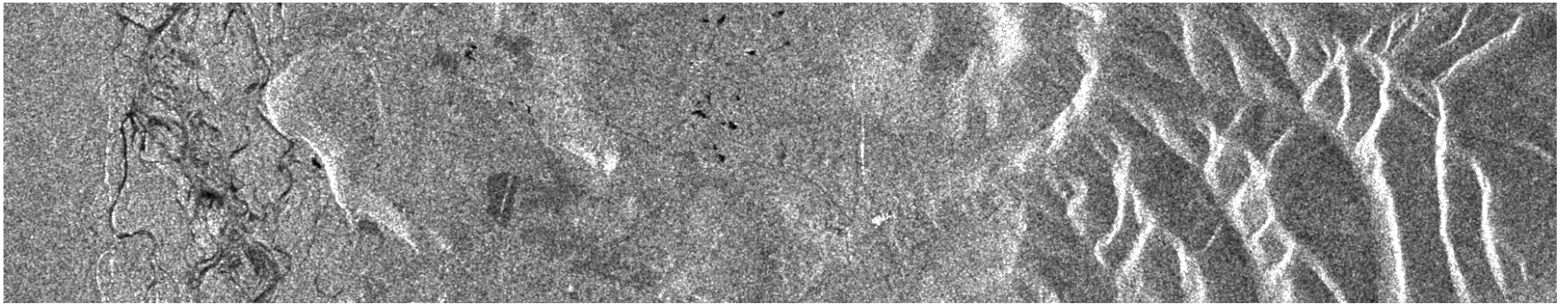
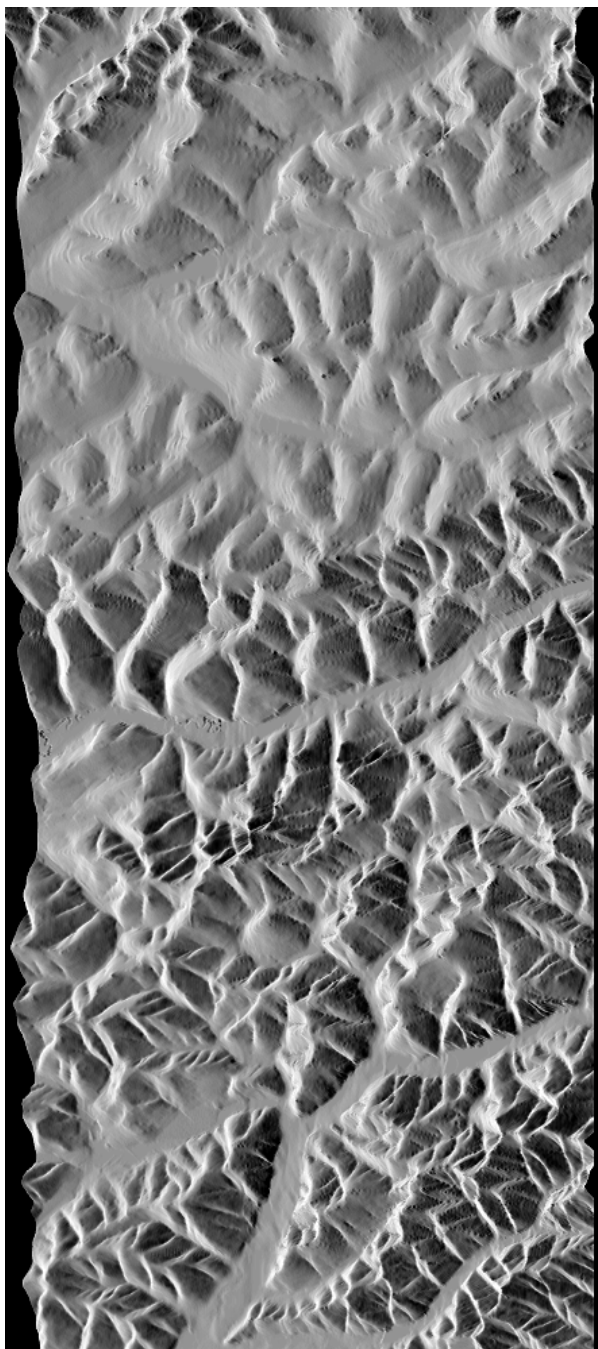


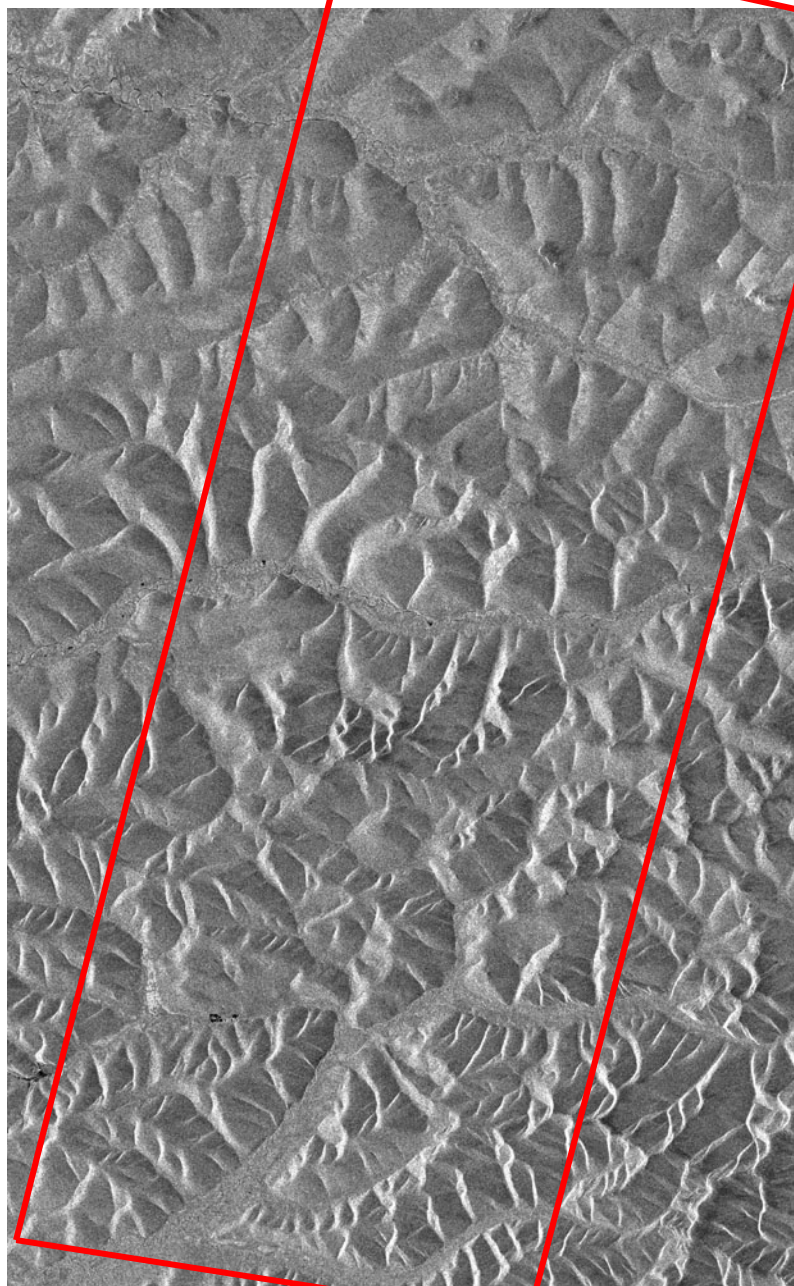
Image by range/doppler algorithm of Sandwell –
issues with range migration, doppler centroid, speckle,
aspect ratio, sampling, etc.



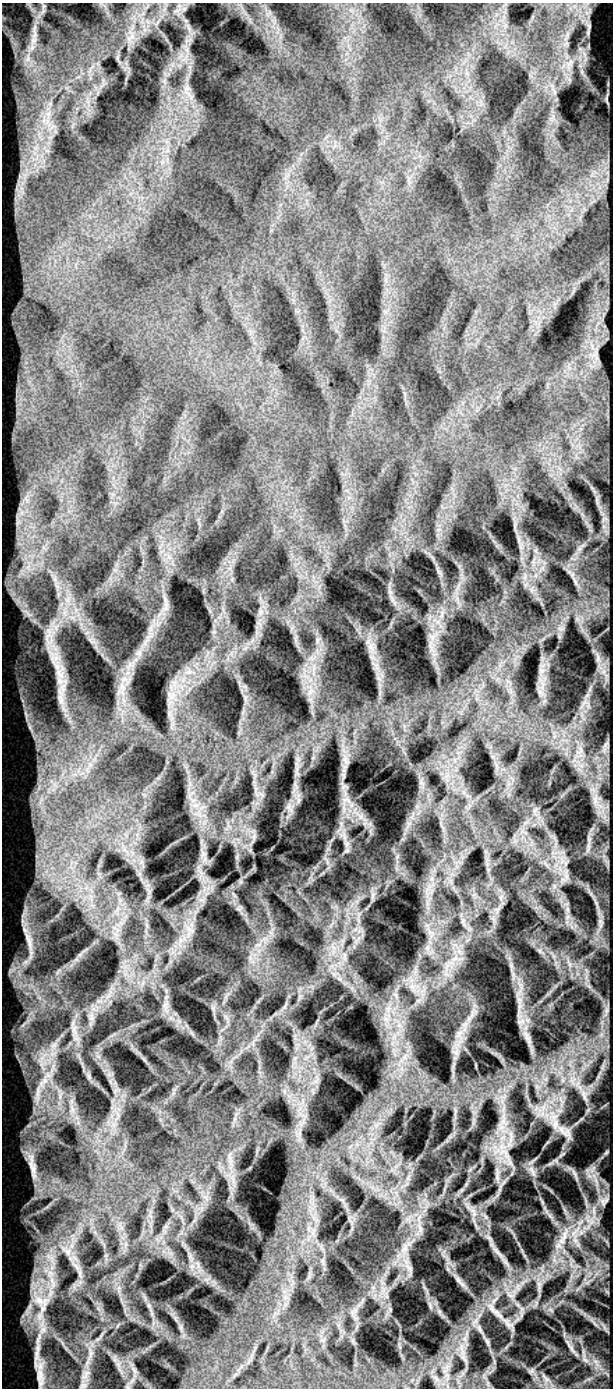
USGS Terrain in Alaska



Simulated Image / North Traj.

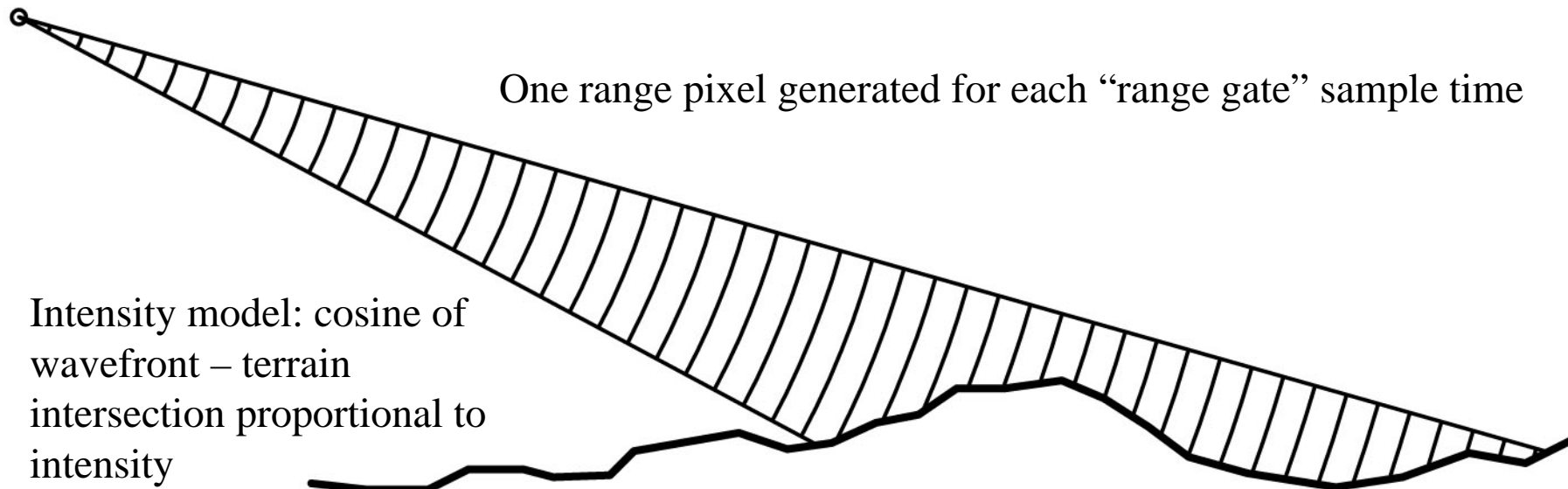


ERS2 Scene Same Area

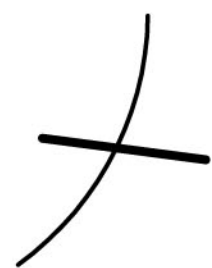


Generated image with addition of uniformly distributed noise to simulate speckle which is characteristic of SAR imagery. At least from first visual inspection, the terrain layover effects and radiometry appear to be depicted consistent with range / cross-range geometry.

Series of figures to Illustrate the Projection Geometry



Small angle yields bright intensity



Large angle (near 90 deg) yields dark intensity

Illustration of intensity model

