Simulation parameters for building model

see simulation results in publication:

Auer S, Gernhardt S, Linear Signatures in Urban SAR Images – Partly Misinterpreted?, IEEE Geoscience and Remote Sensing Letters, 2014, 10, 1762-1766

The model is appropriate to test the following RaySAR aspects:

- simulation of 2D maps (MATLAB GUI „2D_Maps“)
- simulation of 3D phase center positions (MATLAB GUI „3D signal position“) and reflecting surfaces (MATLAB GUI “Scatterer Identification”)

POV-Ray ray tracing:

→ Windows: open the POV-model in POV-Ray and run (→ button „run“) the rendering procedure using the rendering settings [1600x1200, No AA]. Result: „Contributions.txt“ in model folder. Define the intended setting in ini-file „QUICKRES.INI“ (→ button „Ini“) if it is not available yet.

→ Linux: use the terminal command „povray Step.pov +W1600 +H1200“ in the folder of the POV-model. Result: „Contributions.txt“ in model folder.

Sensor

Heading angle: 346.45°

Azimuth spacing: 0.428m

Slant Range spacing: 0.220m

Ground Range spacing: 0.571m

Resolution (azimuth, range): 1.10m x 0.59m (via check button “Impulse response”); for the simulation of a reflectivity map, the check button is deactivated → no filtering with TSX impulse response function is performed.

Geometry

Angle of incidence: 22.62°

(Slant) Range interval: 75 135

Azimuth interval: -40 40

Radiometry

- Coherent summation, clipping value 2

Rendering

Image size: 80 m width x 60 m height

No. pixels: 1600 x 1200

Surface material:

- Ground: finish {reflection {0.5} ambient 0 diffuse 0.01 specular 0.5 roughness 0.0033}
- Building: finish {reflection {0.7} ambient 0 diffuse 0.01 specular 0.7 roughness 0.00085}
- Window_Frames: finish {reflection {0.7} ambient 0 diffuse 0.01 specular 0.7 roughness 0.00085}
- Metal_Grid: finish {reflection {0.7} ambient 0 diffuse 0.01 specular 0.7 roughness 0.00085}
- Windows: finish {reflection {0} ambient rgb<0, 0, 0> diffuse 0 }

- Bars: finish {reflection {0.7} ambient 0 diffuse 0.01 specular 0.7 roughness 0.00085}

Sensor position / Center of footprint: location <0, 100,-41.6669>; look_at <0,0,0>

Translations/rotations: translate <-8.474543, 0, -36.161479>; rotate < 0,-76.45,0>

3D phase centers

- Cube size for model export: 0.1m

3D intersection points

- Cube size for intersection point: 0.02 m