

## Microlocal analysis of bistatic SAR

Raluca Felea, Rochester Institute of Technology

We consider two bistatic cases arising in SAR imaging: when the transmitter and receiver are moving in the same direction or in the opposite direction with different speeds. In both cases artifacts appear and they are as strong as the bona-fide part of the image. We use microlocal techniques to classify the forward operator  $F$  as a Fourier integral operator with fold/blowdown singularities. To reconstruct the image, we study the normal operator  $F^*F$  and we show that it belongs to a class of distributions associated to two cleanly intersecting Lagrangians,  $I^{\{2m,0\}}(\Delta, \Lambda)$  where  $\Delta$  is the bona-fide part of the image and  $\Lambda$  is the artifact. Moreover, we demonstrate that as soon as the source and receiver start to move in opposite directions, there is an interesting bifurcation in the type of artifacts that appear in the image.