

1143-44-317

**Yang Zhang\*** (zhan1891@purdue.edu). *Artifacts in the Inversion of the Broken Ray Transform in the Plane.*

We study the integral transform over a general family of broken rays in  $\mathbb{R}^2$ . One example of the broken rays is the family of rays reflected from a curved boundary once. There is a natural notion of conjugate points for broken rays. If there are conjugate points, we show that the singularities conormal to the broken rays cannot be recovered from local data and therefore artifacts arise in the reconstruction. As for global data, more singularities might be recoverable. We apply these conclusions to two examples, the V-line transform and the parallel ray transform. In each example, a detailed discussion of the local and global recovery of singularities is given and we perform numerical experiments to illustrate the results. (Received August 17, 2018)