

## Feasible Sets: 1D and the general phase problem

L. D. Marks ([l-marks@northwestern.edu](mailto:l-marks@northwestern.edu))  
Department of Materials Science and Engineering  
Northwestern University  
Evanston, IL 60201

A clean way of looking at the general phase problem is to use a feasible set approach. This allows one to generalize, including as appropriate crystallographic constraints such as the presence of atoms (e.g. [1]). After providing a brief overview of this approach, I will focus on some particular 1D and pseudo-1D problems, in particular inversion of the current through a Josephson Junction [2], inversion of x-ray reflectivity data [3] and the use of a 1D compact support constraint to help solve surface structure problems (e.g. [4-6].)

## References

1. L. D. Marks, W. Sinkler and E. Landree, *Acta Crystallographica A* **55**, 601 (1999)
2. M. Carmody, E. Landree, L.D. Marks and K. Merkle, *Physica C* **315**, 145 (1999)
3. E. Bengu, M. Salud and L.D. Marks, *Physical Review B*, in press
4. L. D. Marks, E. Bengu, C. Collazo-Davila, D. Grozea, E. Landree, C. Leslie and W. Sinkler, *Surface Reviews and Letters* **5**, 1087 (1998)
5. L. D. Marks, *Physical Review B* **60**, 2771 (1999)
6. C. Kumpf, L. D. Marks, D. Ellis, D. Smilgies, E. Landemark, M. Nielsen, R. Feidenhans'l, J. Zegenhagen, O. Bunk, J. H. Zeysing, Y. Su and R. L. Johnson, *Physical Review Letters* **86**, 3586 (2001)