Some of the issues under the rug

The majority of the numerical complications here arise in the high-genus regime:

- Need to work with a numerically well-conditioned basis of differentials (and then normalize).
- Solve large linear systems iterative (find a good preconditioner).
- Deal with numerical instabilities intrinsic to the Abel map.

Some unresolved issues:

- Estimates for the truncation of the jump contours?
- Limit of the period matrix?
- Stability of the discretized singular integral operators?
- Zabusky-Kruskal problem?
- ...

Outlook

- Numerical IST for decaying data is effective for the IVP but currently does not make use of any fast transforms.

- Nonlinear superposition allows for the combination of solutions from “different” IVPs.

- Numerical IST for periodic data is effective and can handle large(ish) genus — FMM for larger?

- Is there an effective method to bypass deformations?