# Resurgence of the Airy function and other exponential integrals

## To-do list

### Conventions

* ~ (Veronica) Change the computation with Sauzin to be in line with convention~
* (Aaron) Finish switching the Airy and Airy-Lucas sections to the literature sign convention ### Proofreading
* (Aaron) Understand new material in “A new perspective: Borel regularity”
* (Aaron) Proofread copied-in sections about Laplace transform
* (Aaron) Check the Bessel equation in the spatial domain that corresponds to the Airy-Lucas equation in the frequency domain
* (Aaron) Look over general modified Bessel example ### Introduction
* (Veronica) Turn Nevanlinna-Watson bullet points into prose ### General results
* Prove Theorem 2 (from outline)
* Ask Fredrick whether existence and uniqueness appendix might be publishable on its own
  + (Veronica) Get in touch
  + (Aaron) Send summary of existence and uniqueness results ### Examples
* Airy-Lucas
  + (Aaron) Plot Λ(k) contours
  + (Aaron) Copy the hypergeomtric function identity used in the contour argument into an appendix
  + ~(Veronica) Copy in asymptotic analysis~
  + Show how the proof of Theorem 2 works by going through it in this special case
    - ~ (Veronica) Construct *W̃*1 and *W̃*−1 in the “Asymptotic analysis” section~
    - (Aaron) Revise the “Borel regularity” section to mirror the proof of Theorem 2
    - (Aaron) Confirm the uniqueness argument by showing explicitly that ṽ1 sums to a multiple of v1
* General modified Bessel
  + (Aaron) Plot contours
  + (*unassigned*) Generalize the differential equation argument used for Airy-Lucas
* (Aaron) Add vibrating beam example
* Fix mistaken coefficients in hyper-Airy 5 example
  + (Aaron) Check over the Sage notebook that gave the coefficients in the current draft
  + (both) Compare with the Mathematica notebook that gives different coefficients
* Generalized Airy
  + (Veronica) Try to do contour argument
* Hyper-Airy
  + Try to do contour argument (stuck right now)
  + Try plugging ζ = 27u4 − 4u into a generic hypergeometric series in ζ and comparing with the power series of 1 / 4(27u3 − 1) ### Comparisons
* ~(Veronica) Write out the comparison with Mariño in the desired way~