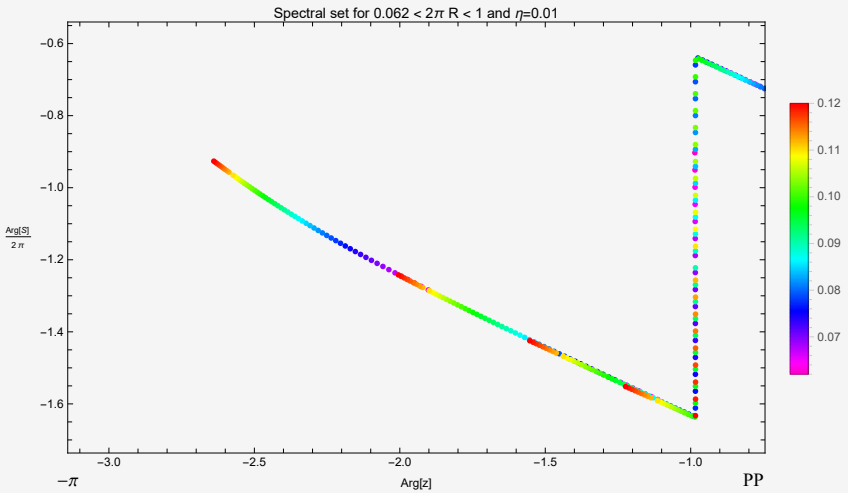
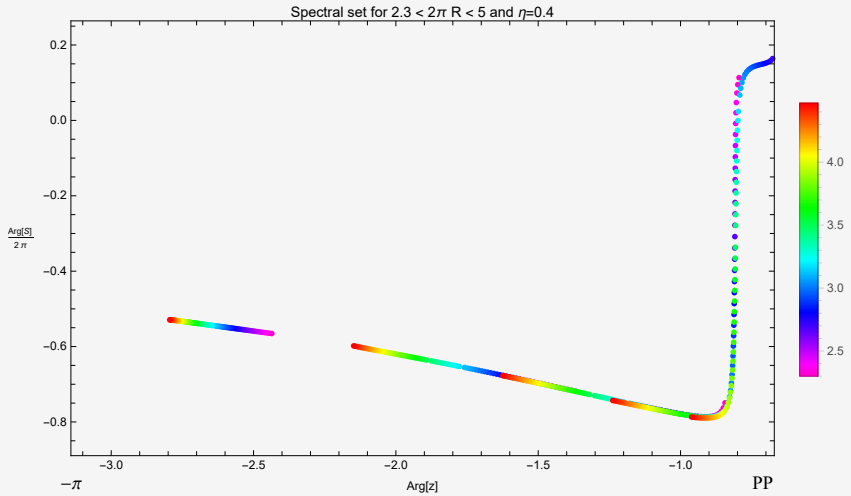
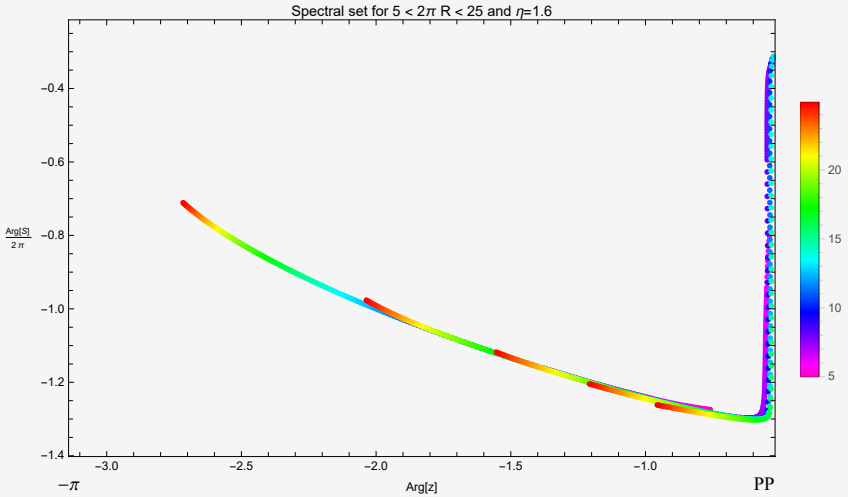
# IFT slides

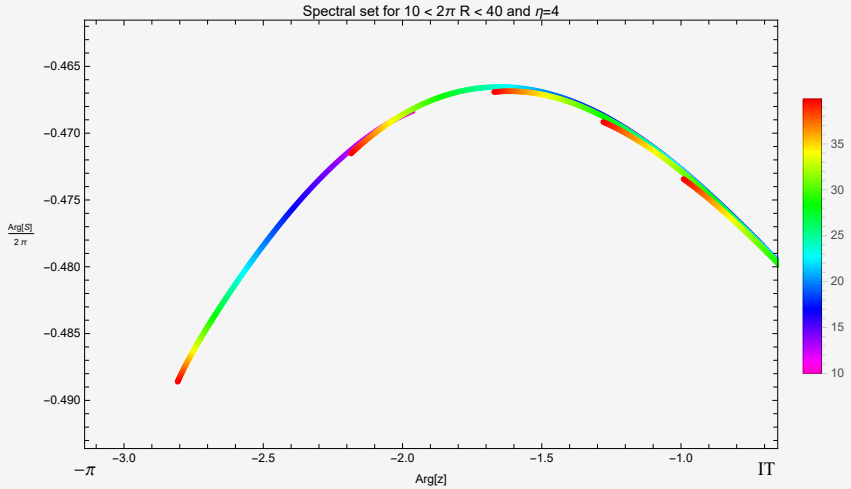
March 2, 2020

# Elastic Phase from TFFSA



# Goal: use bootstrap to augment results

**Do results** constraint the space of allowed S-matrices?

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**Specifically**

Resonance spectrum? (zeros of $S(z)$)

Interaction strength? ($\propto Res_{z->z_i}\ S(z)$)

High E limit ($\lim_{z->1} S(z)$)

In-elasticity profile ($f$)

# Complex analysis Lemma

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**@Boundary** $|F| < 2$

**Lemma** In the interior of the disc

$$|F(z)| \leq 2^{1-\frac{1}{2\pi}|\tau_z^{-1}(\mathcal{I})|} \exp\left[\int_{\tau_z^{-1}(\mathcal{I})} \frac{du}{2\pi i u} \log|F(\tau_z(u))|\right]$$

$\tau_z(w)$ is a Möbius map taking the disk to itself and 0 to $z$,

$$\tau_z(w) = \frac{-\bar{z}z + z(w+i) + iw}{-\bar{z} + \bar{z}(z+i)w + i} \tag{1}$$

# Conclusion

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$\rightarrow$ sad physicist

$\rightarrow$ TV binge watching

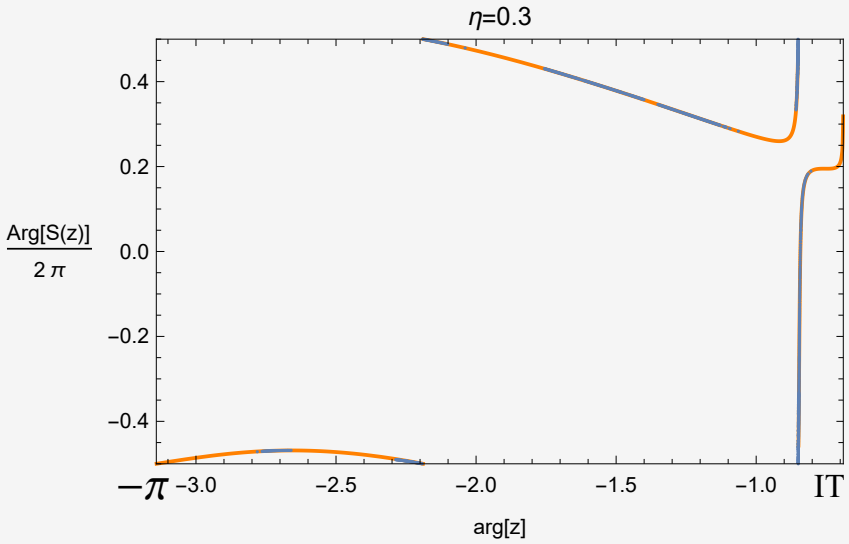
$\rightarrow$ new Ansatz

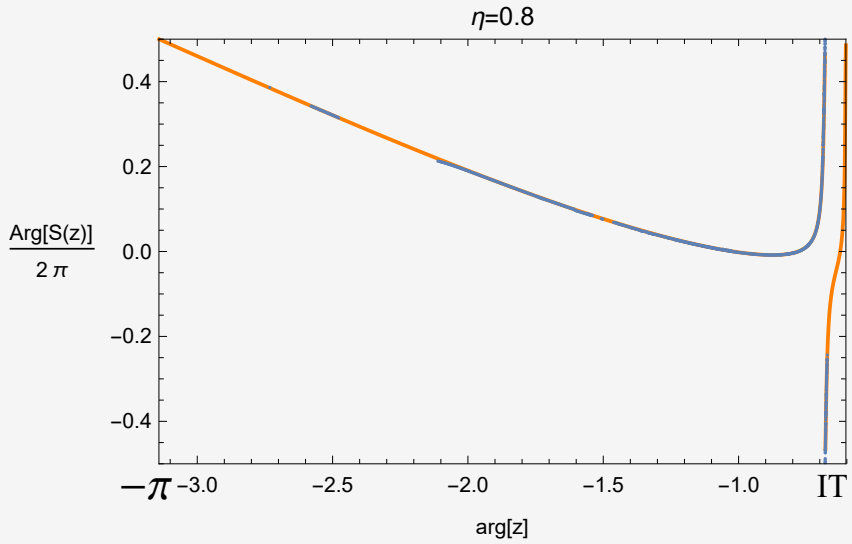
# Family of Ansztzes

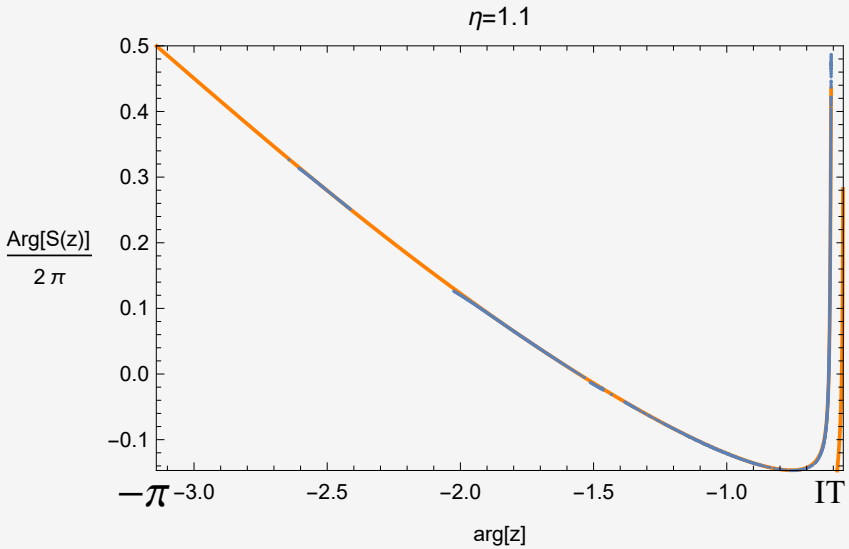
$$\widetilde{g}(z) = \left( \prod_{k=1}^{M} \frac{z_k' - z}{1 - z_k' z} \right) S_{\tilde{f}},$$

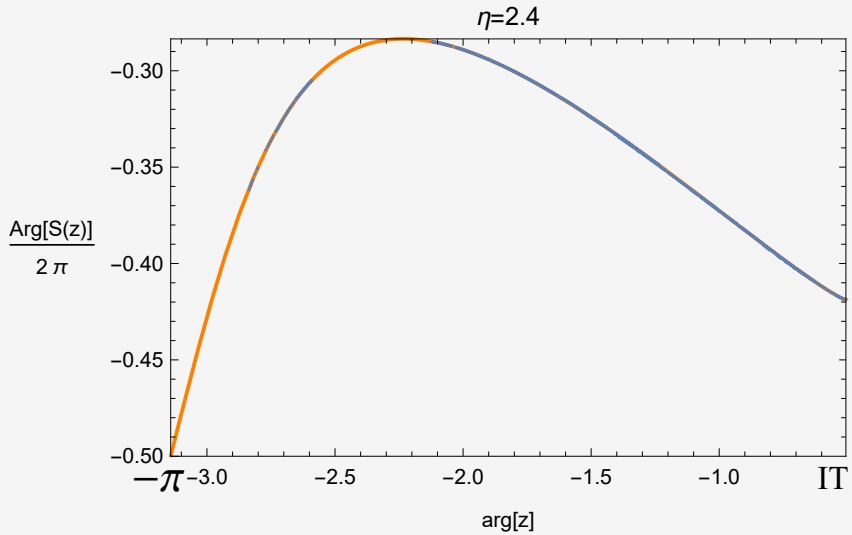
$$S_{\tilde{f}} = \exp \left[ \int_0^{\phi_0} \frac{d\phi}{2\pi} \left( \frac{e^{i\phi} + z}{e^{i\phi} - z} + \frac{e^{-i\phi} + z}{e^{-i\phi} - z} \right) \log[\tilde{f}(\phi)] \right]$$

# Fits for Method II

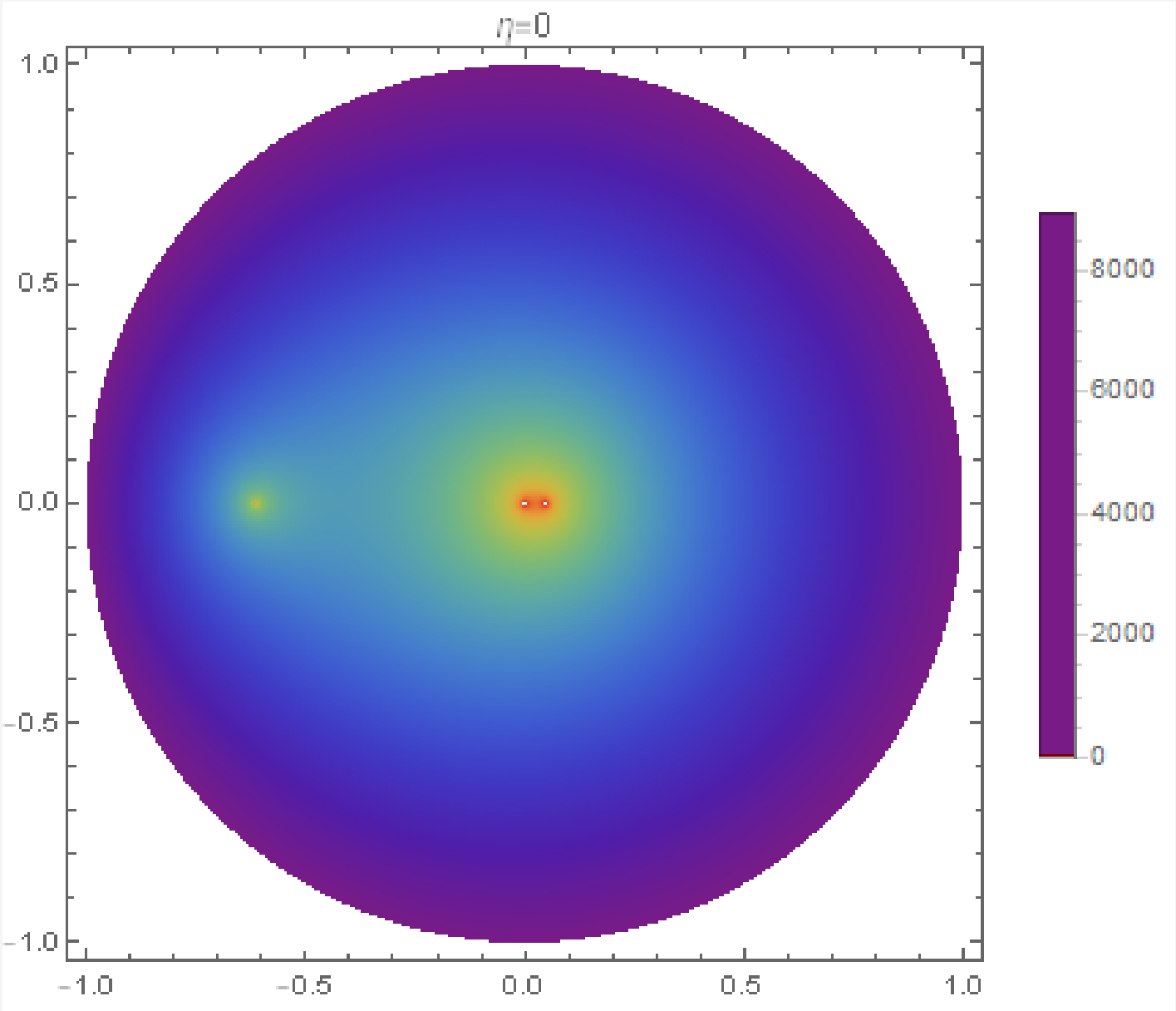


# Evolution of poles and zeros



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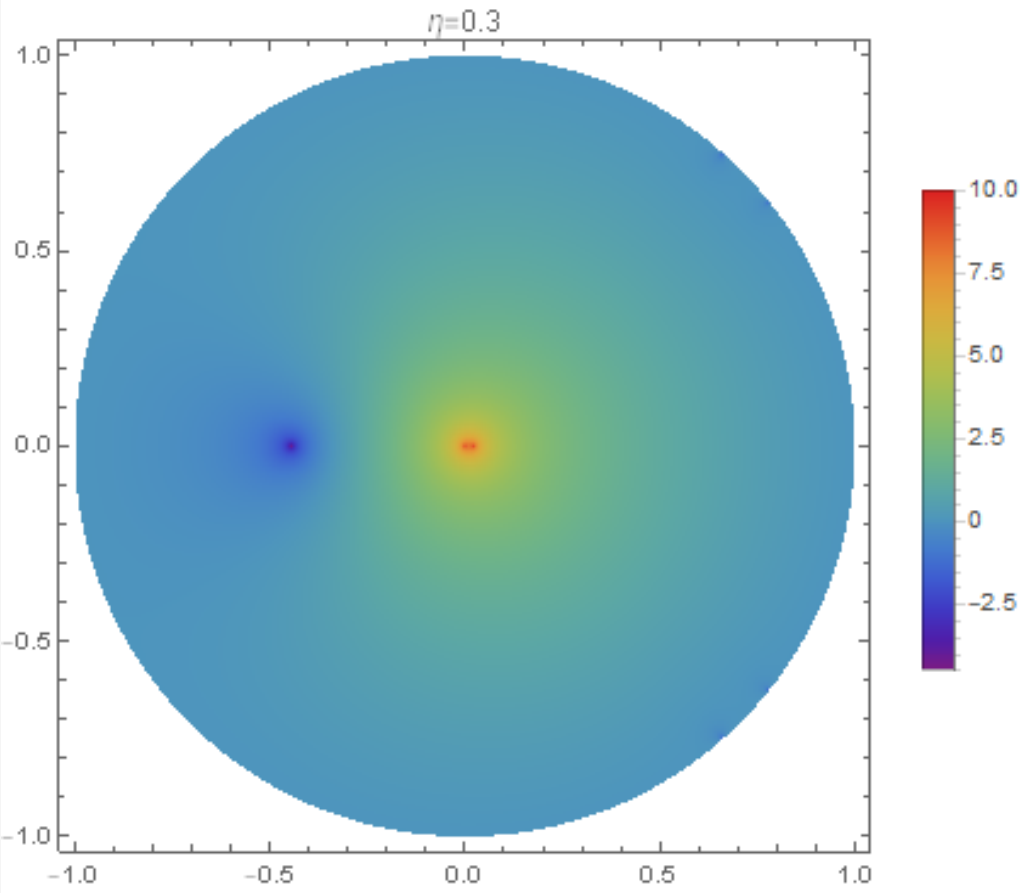


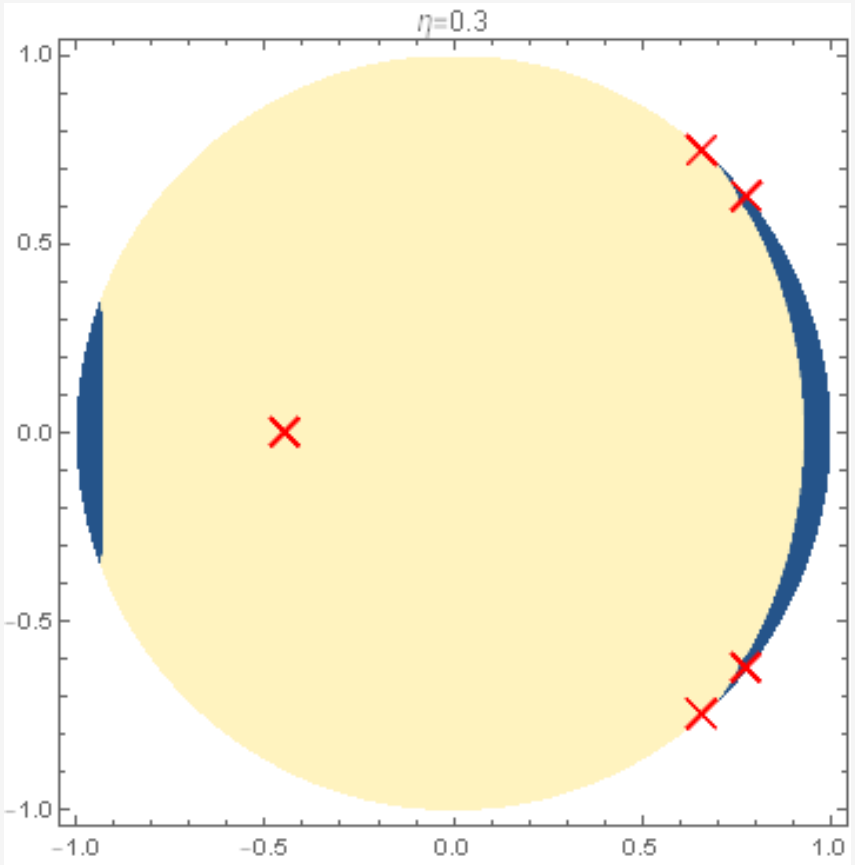

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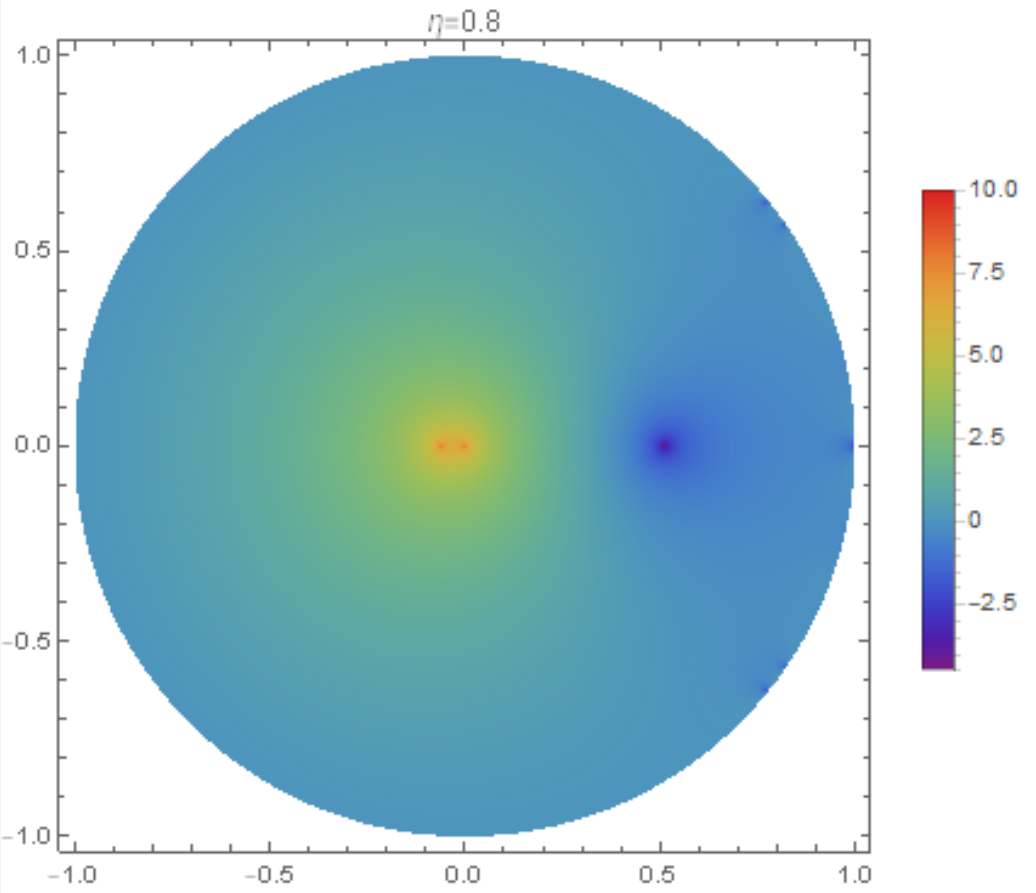


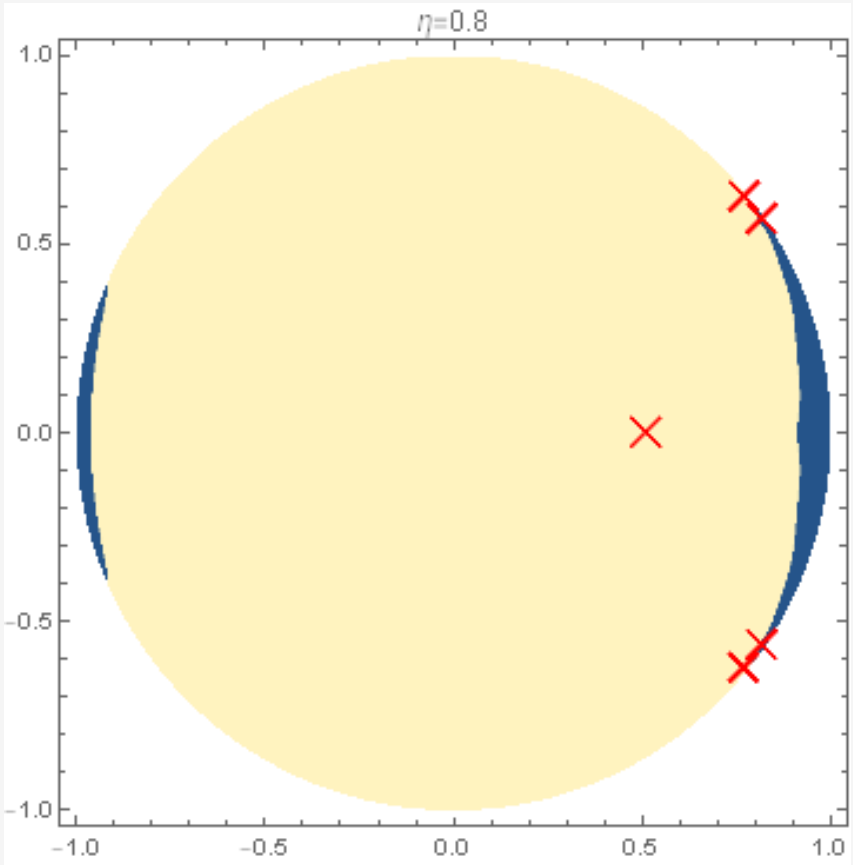

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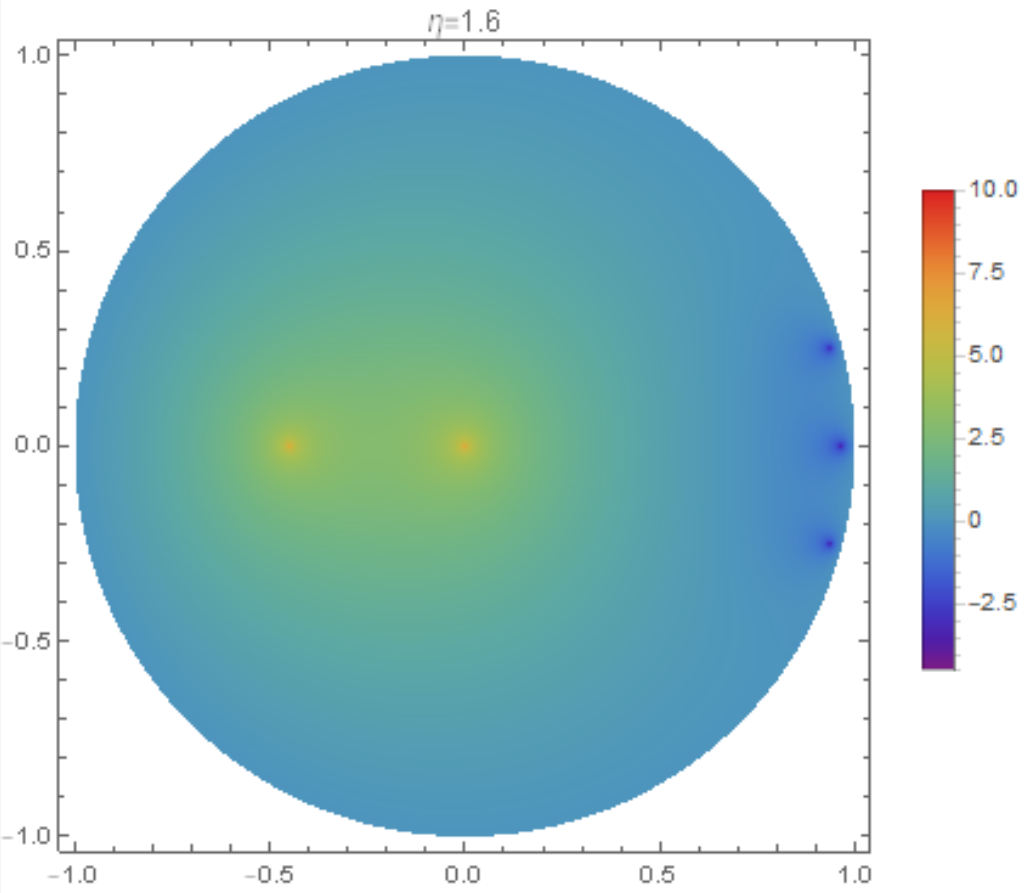


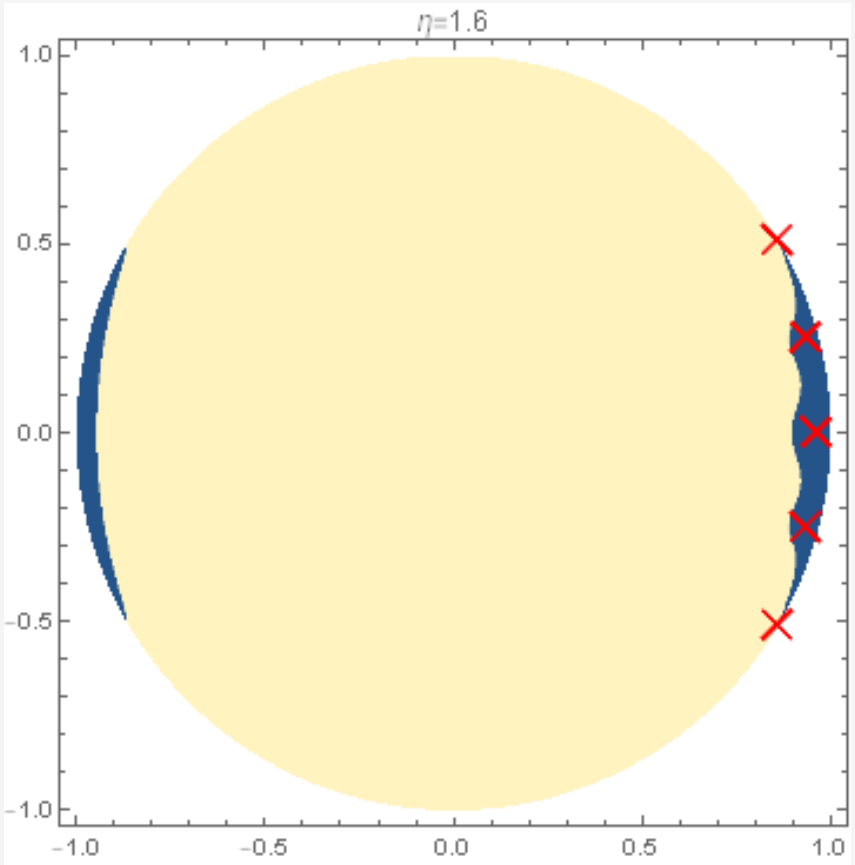

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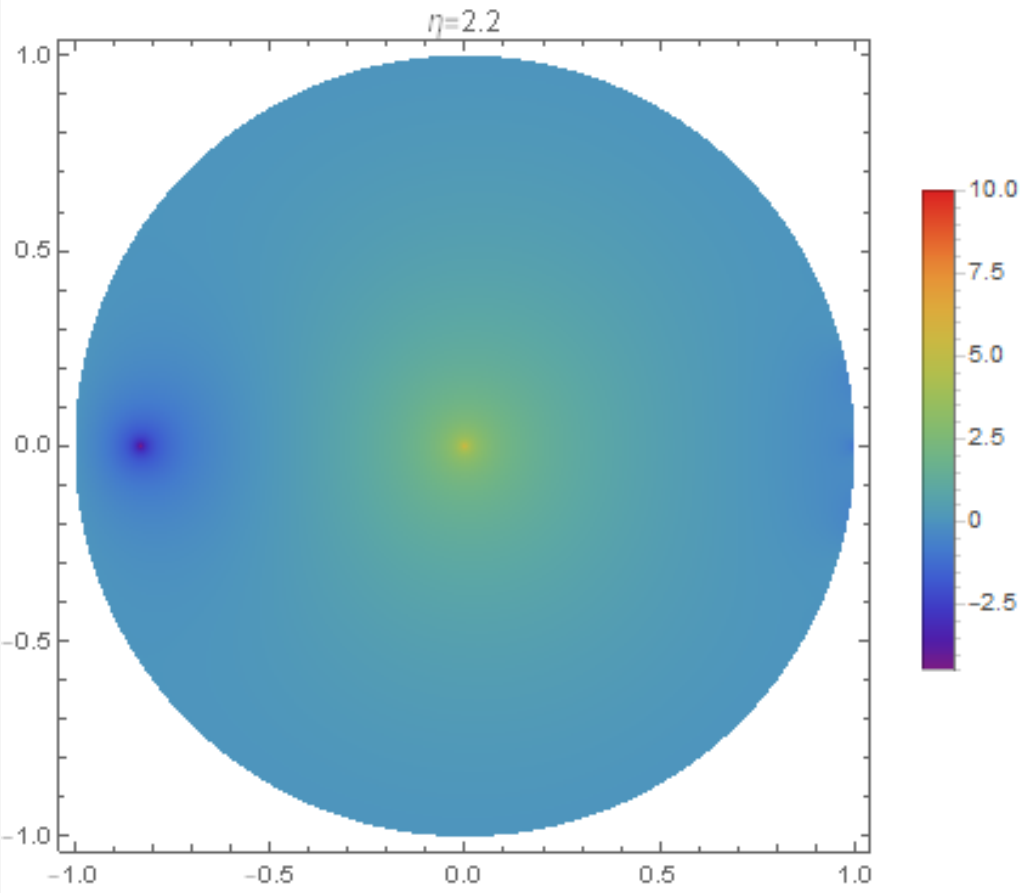


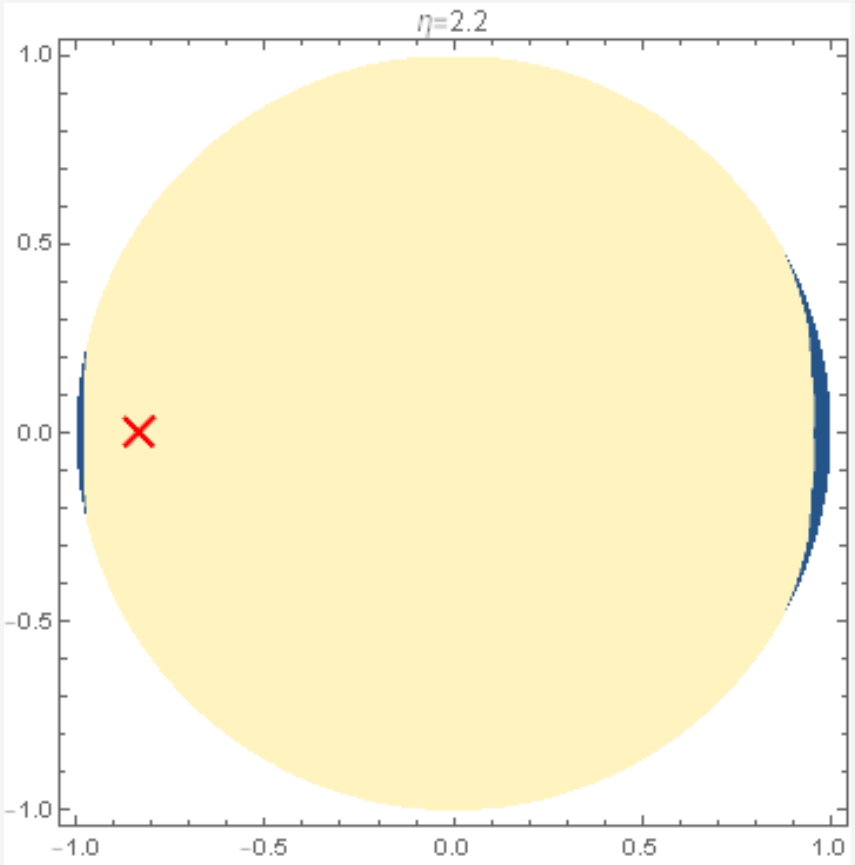

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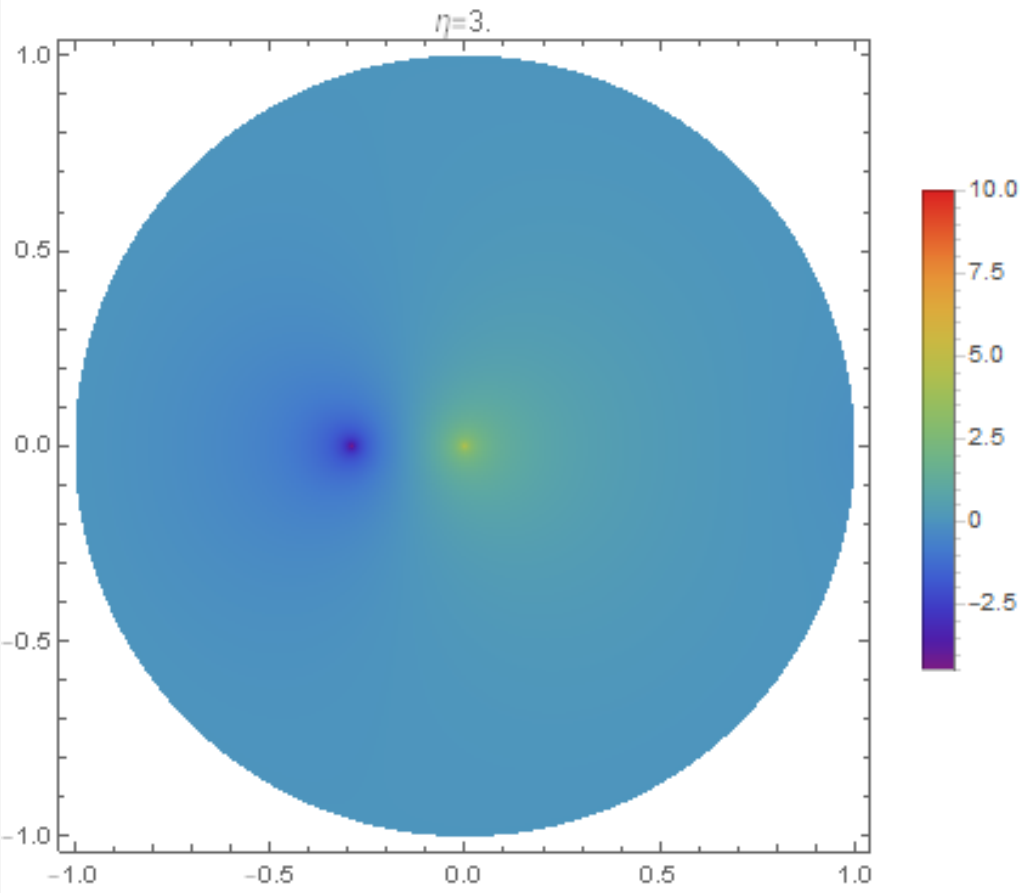


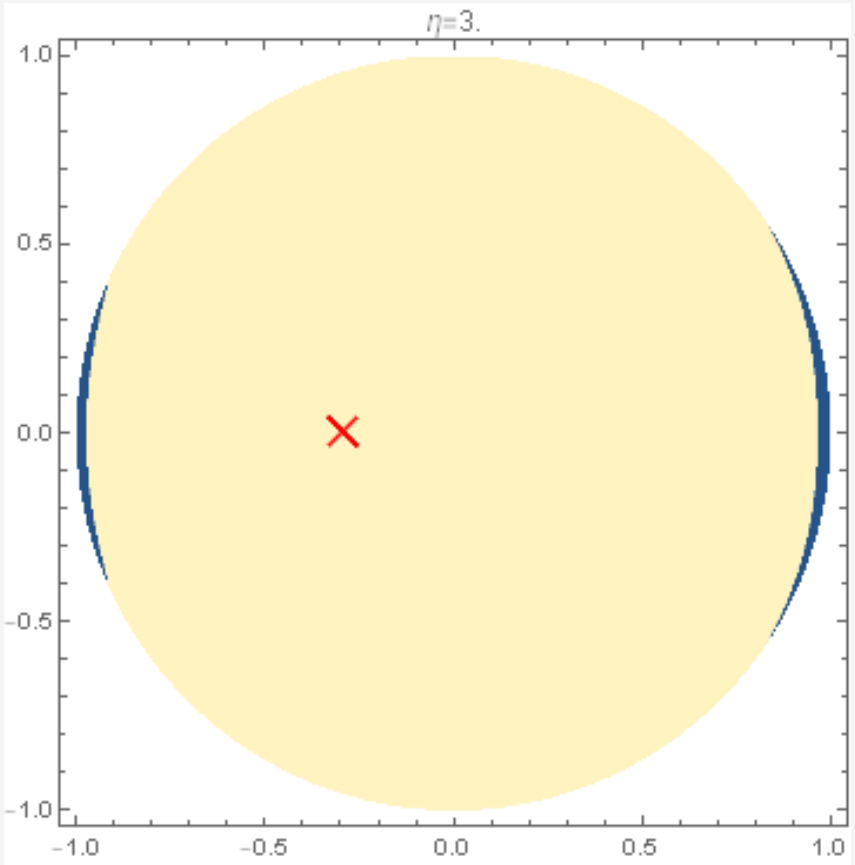

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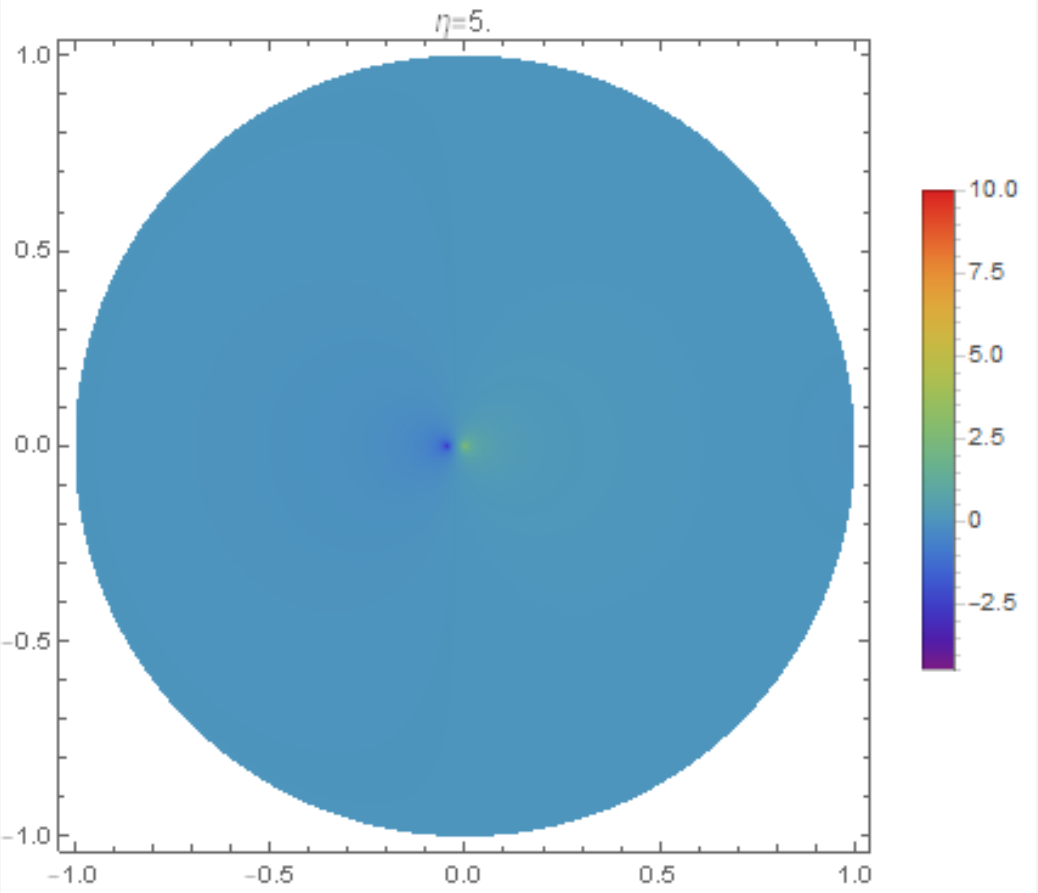
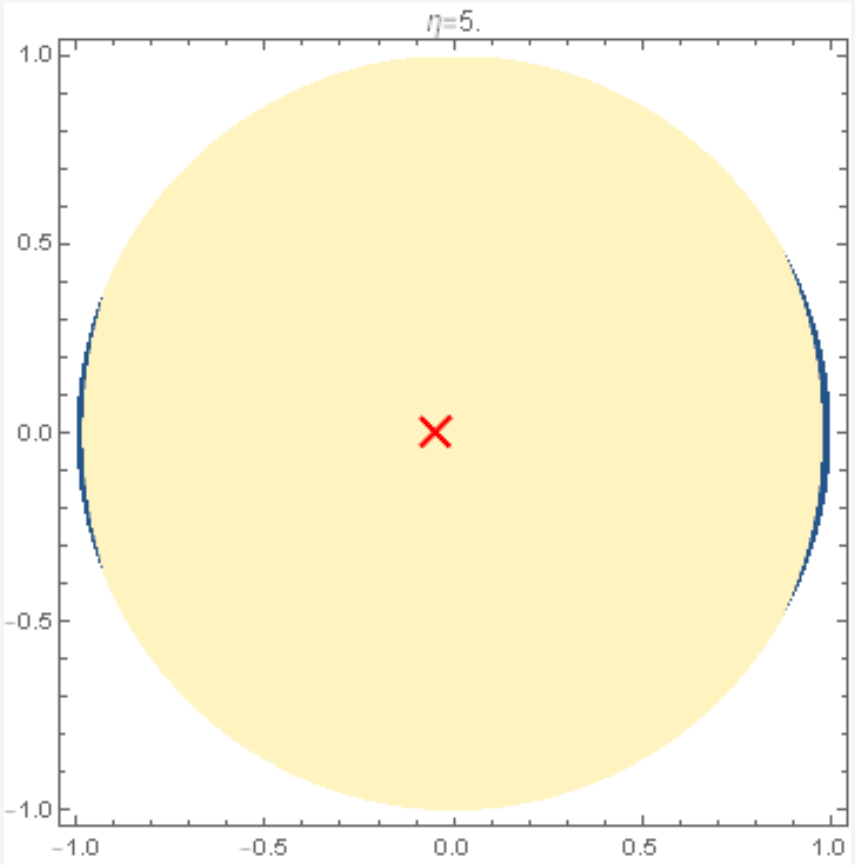
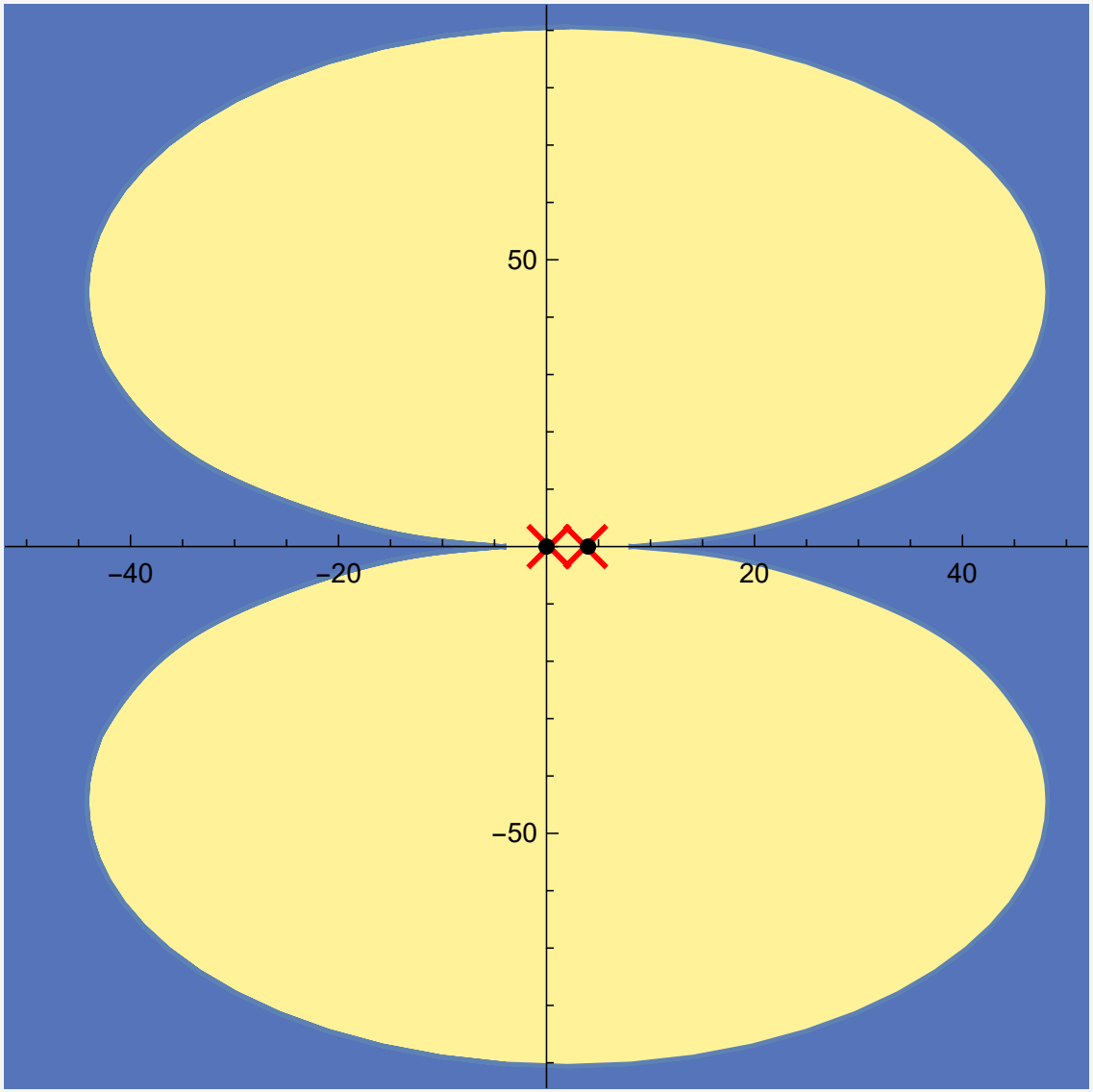
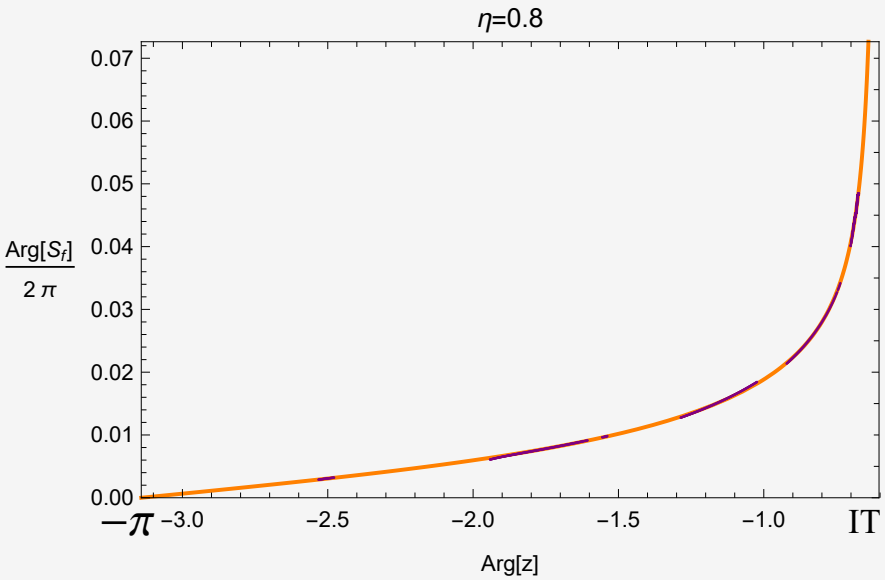


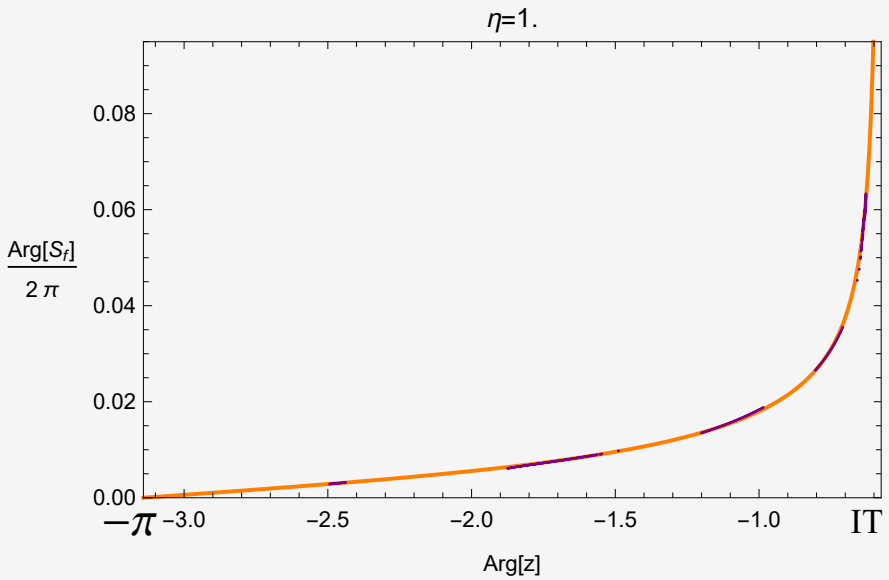



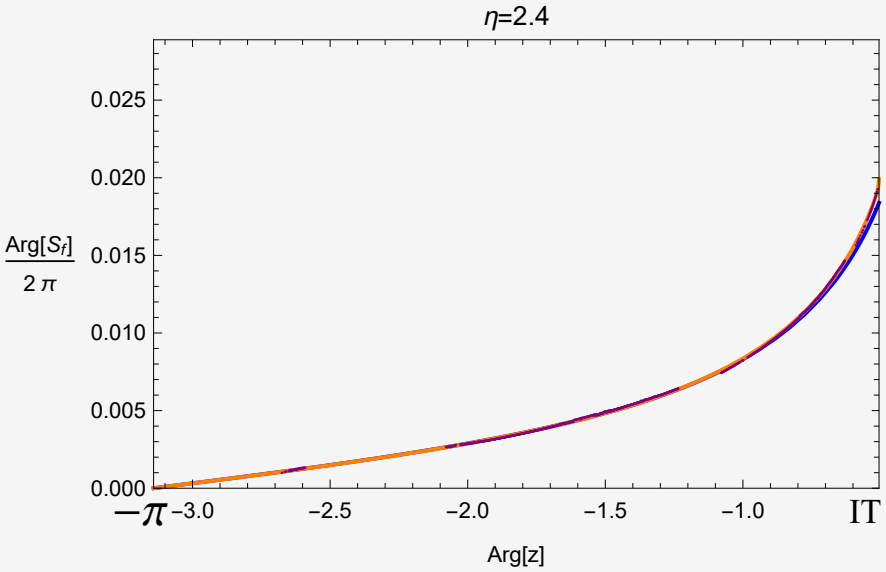
# Exclusion in the $s$-plane

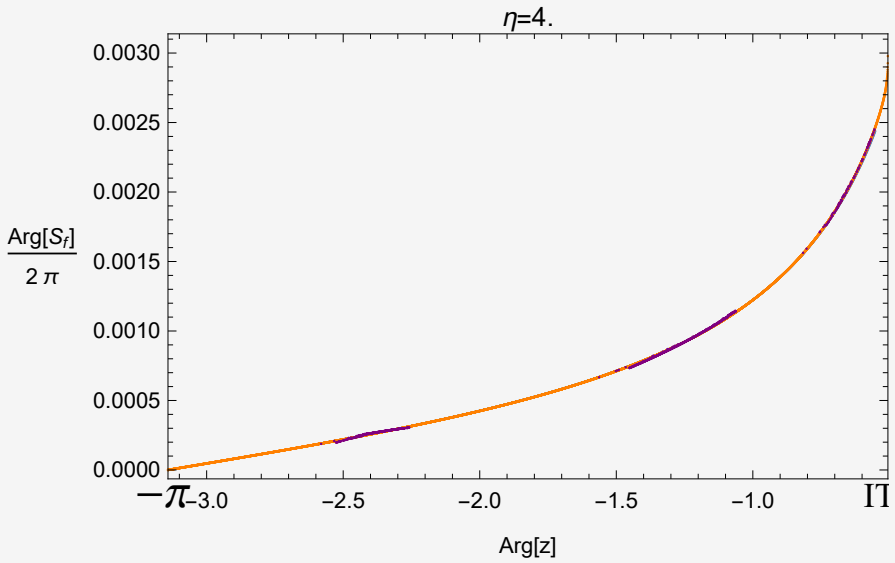


# Inelastic Channel Contribution

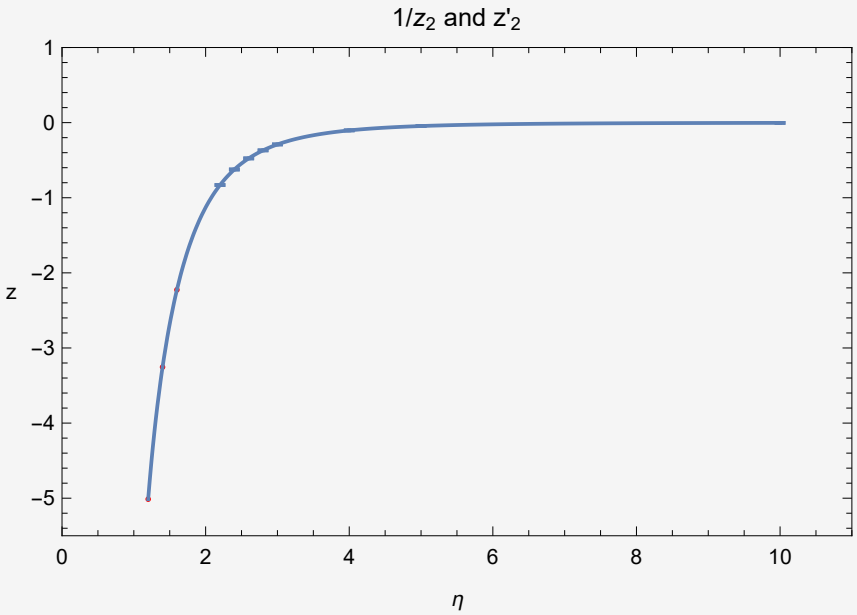


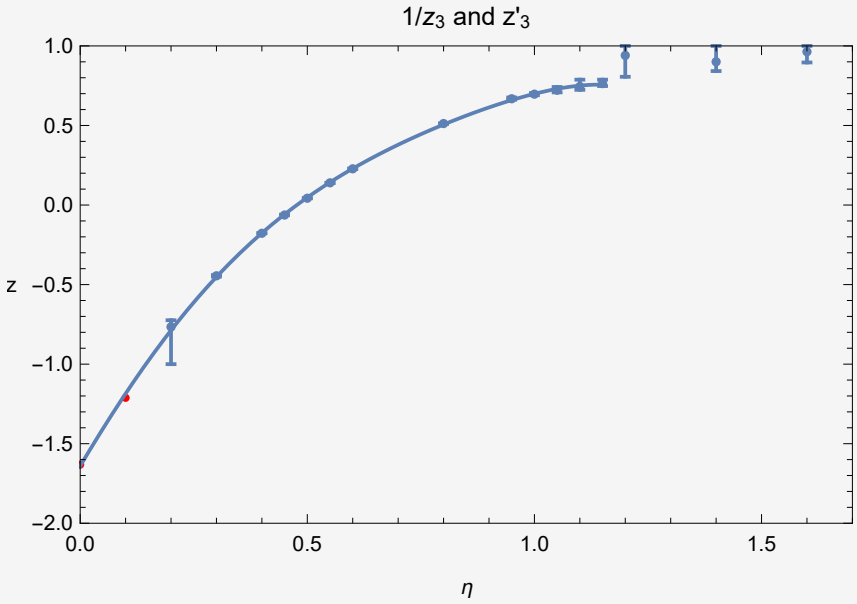



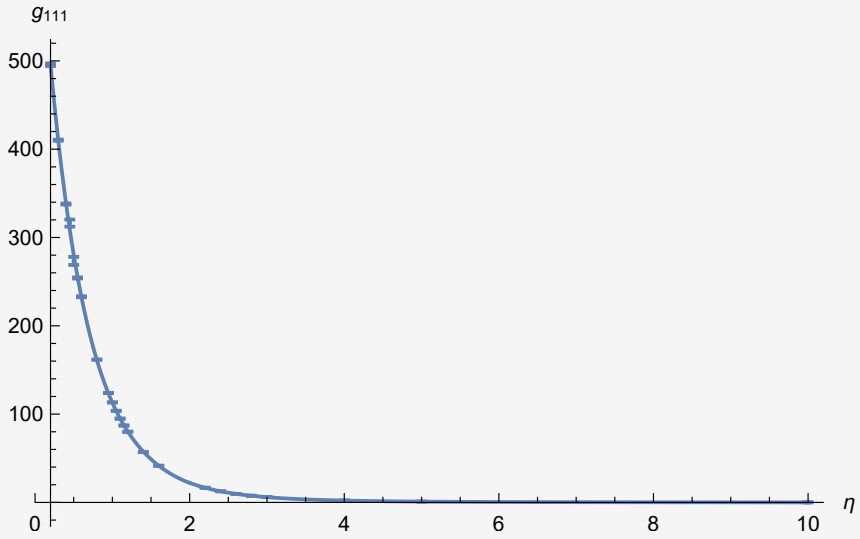



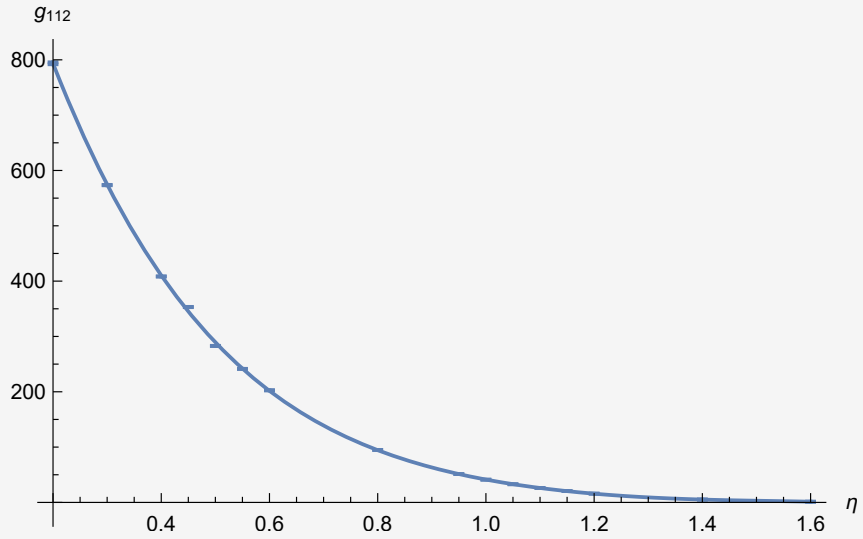
# wide resonances



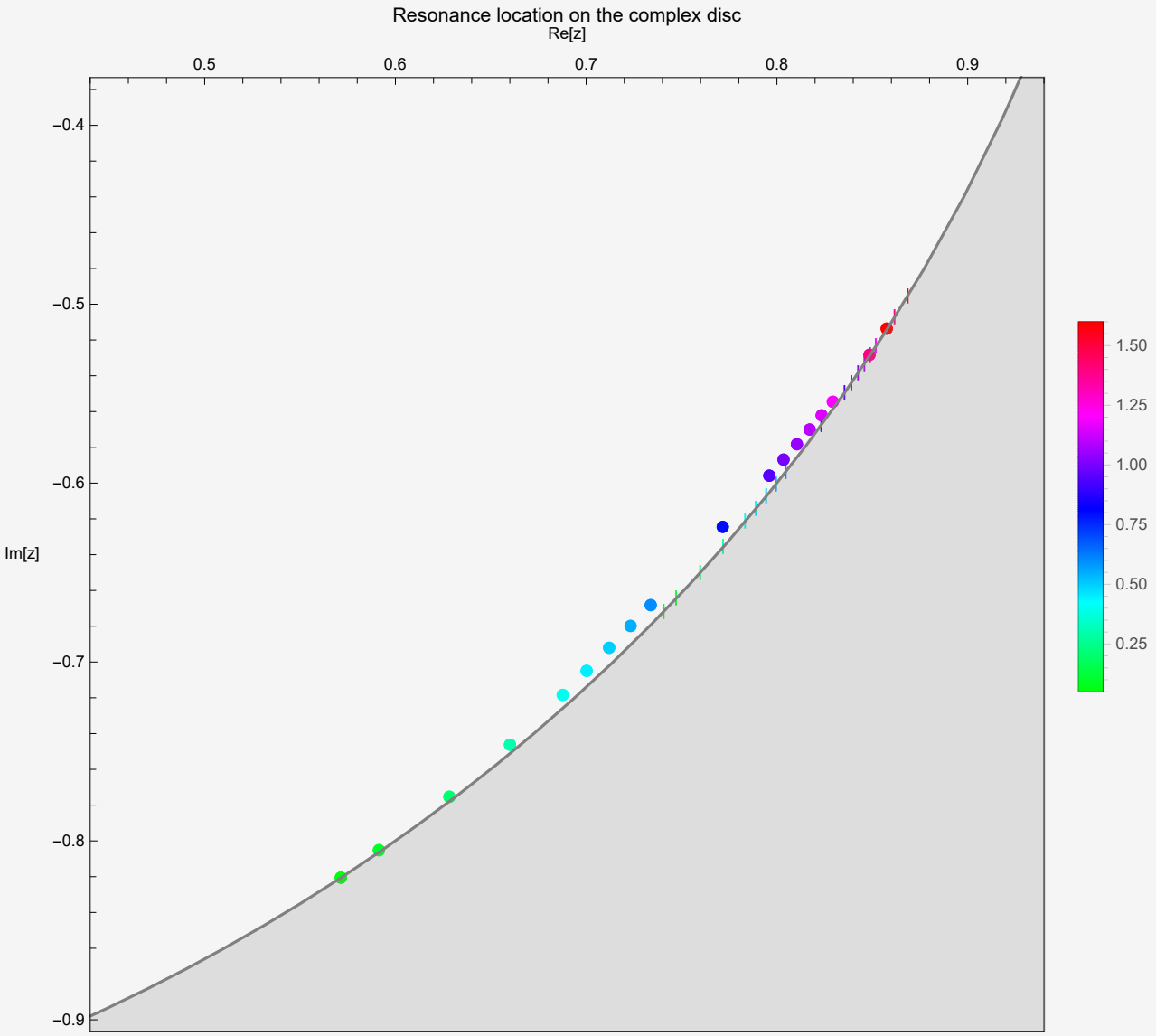



# Coupling constants



# $m_4$ resonance



# $m_4$ resonance - comparison the perturbation theory