Event Horizon Surface of a Distorted Myers Perry Black Hole

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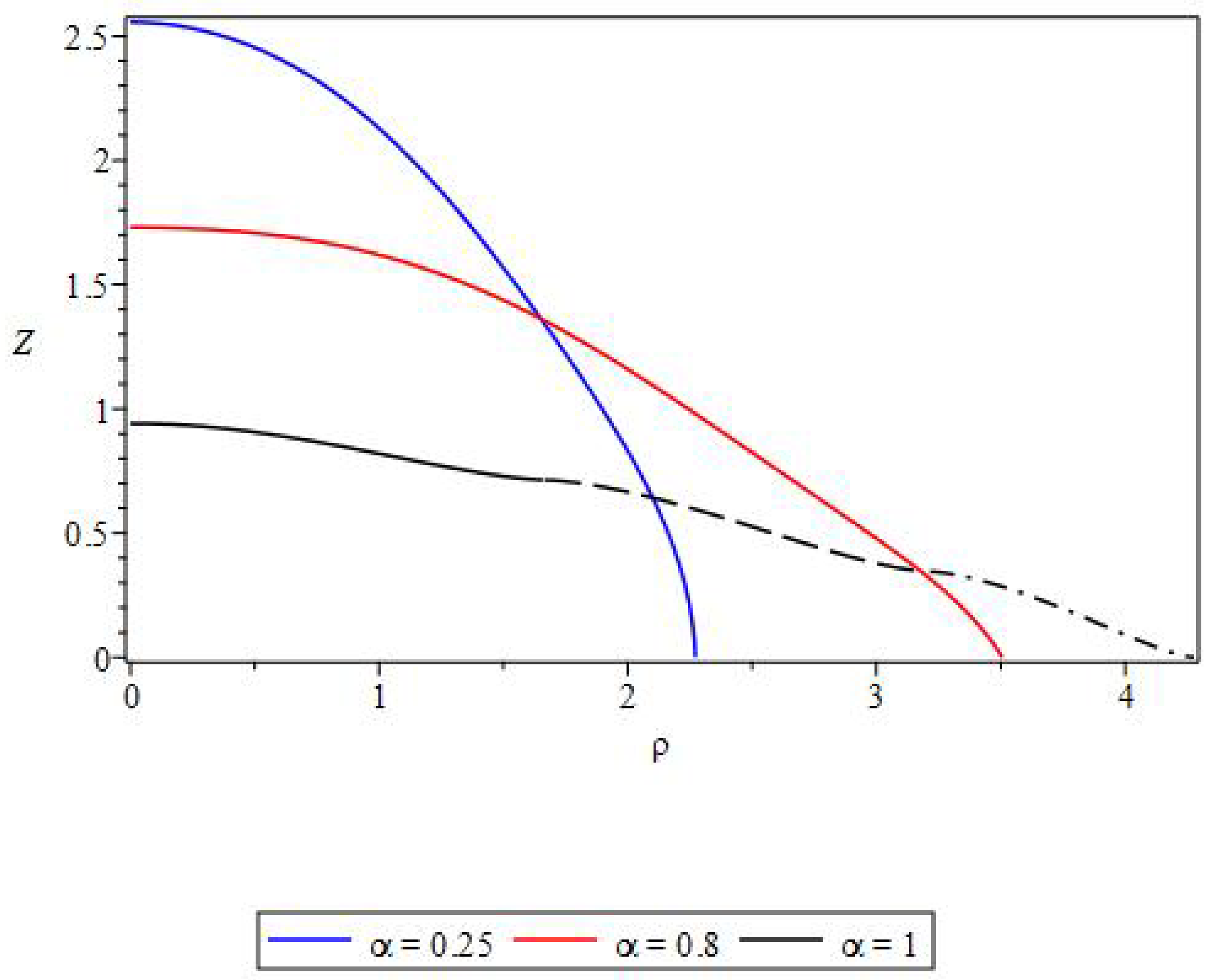
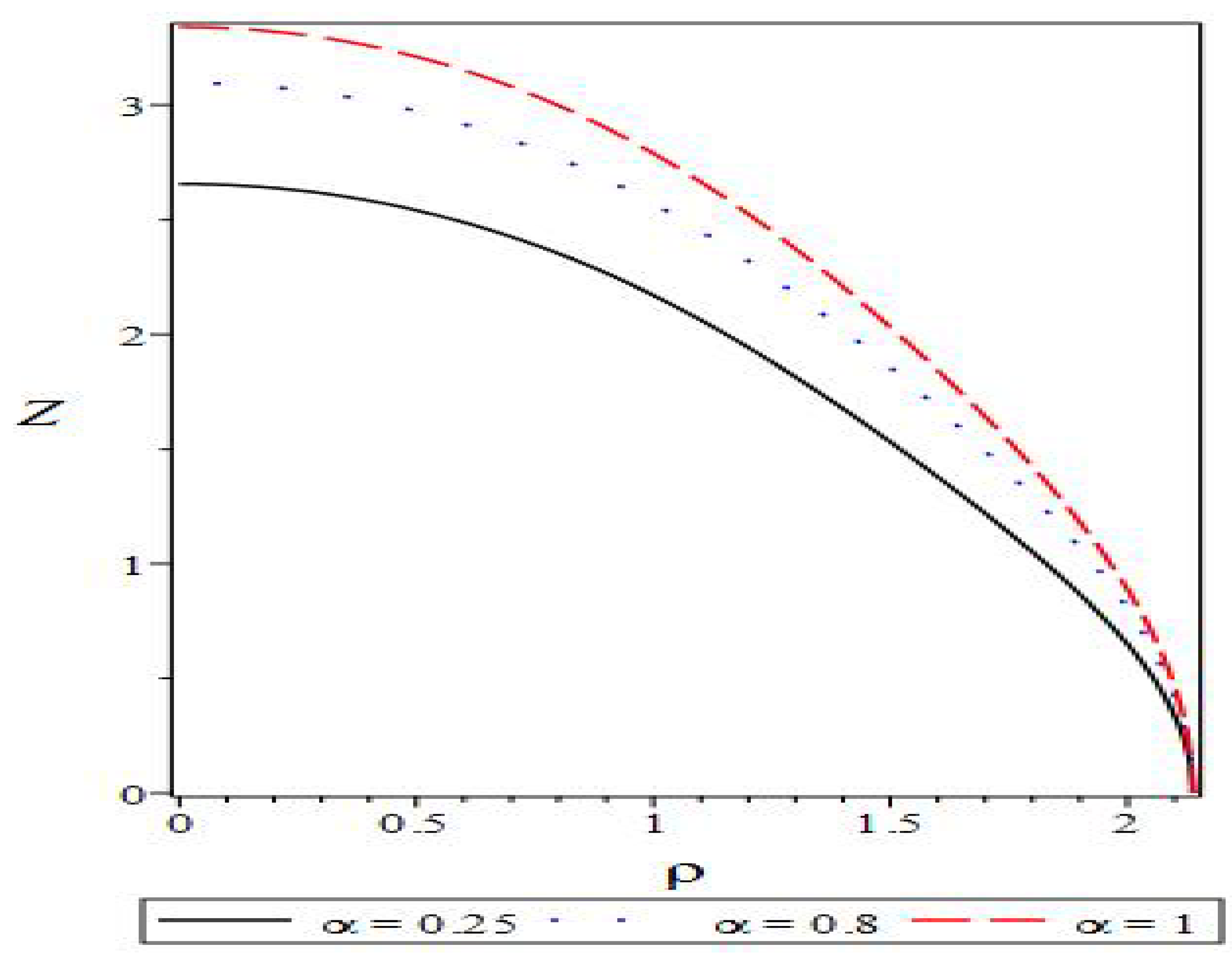
Kellogg Honors College Capstone Project

$$Z(\theta) = \int_{\pi}^{\theta} Z_{,\theta'} d\theta', \quad Z_{,\theta} = \left[\epsilon\left(\sigma\left[1+\hat{a}^2(\theta)\cos^2(\frac{\theta}{2})\right]e^{2(\hat{\gamma}(\theta)-\widehat{W}(\theta))} - \rho^2_{,\theta}\right)\right]^{\frac{1}{2}}$$

The general form of what we called our “F” equation. Along with our Rho equation, this equation produces our horizon surface.



(φ, θ) Section, showcasing the horizon surface with different rotational parameter values. This graph showcases dual quadrupole distortion values of -1/15.



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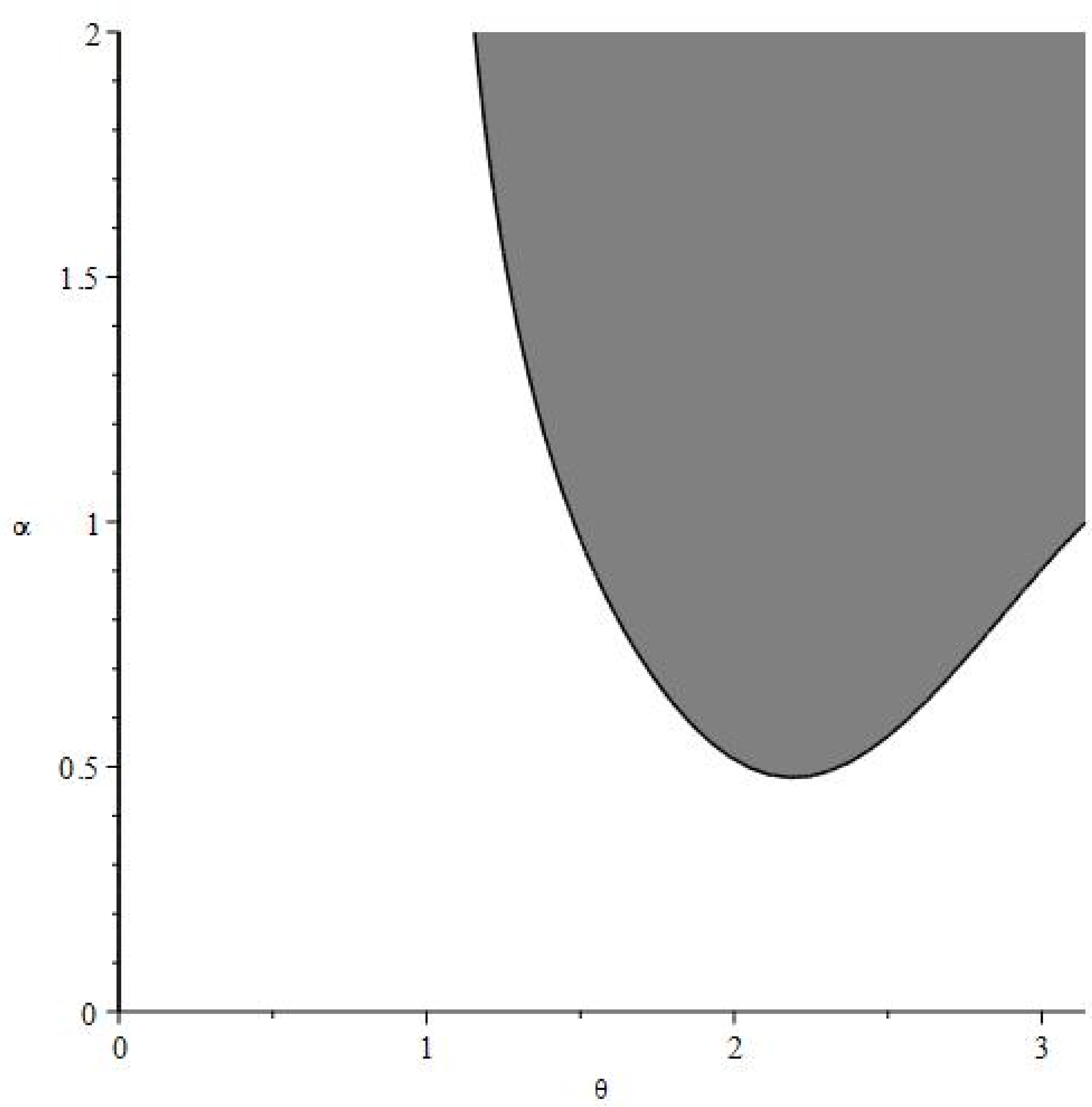
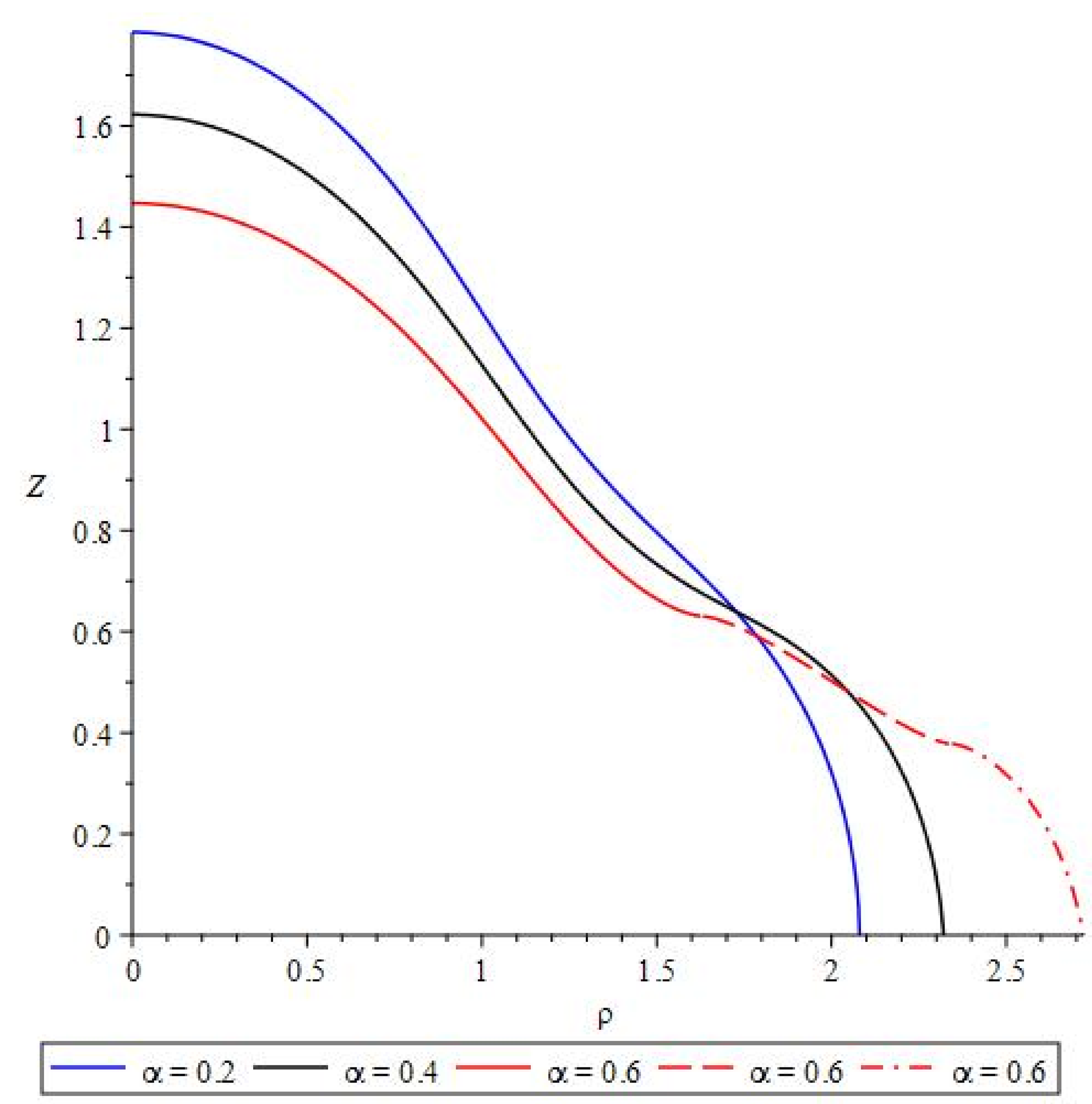


Allowable Alpha Values for a special case, b_0=1/5, b_2=-1/5, a_0=-2/5, and a_2=2/5. The white region indicates where real solutions would occur, while the grey shows areas of an imaginary solution for the horizon surface.



(ψ, θ) Section, showcasing the horizon surface with different rotational parameter values. This graph shows the horizon surface for the special case pictured to the left.