

Erratum: Parametrized quasinormal mode framework for modified Teukolsky equations **[Phys. Rev. D 110, 104007 (2024)]**

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 (Received 14 February 2026; published 6 March 2026)

DOI: [10.1103/88mw-35d4](https://doi.org/10.1103/88mw-35d4)

A tiny omission in Eqs. (D4)–(D7) changed the computation of the coefficients $d_{\omega/B,n\ell m}^{(k)}$ with $k = [3, 4]$. The correct equations read

$$\frac{1}{\Delta} \sum_{k=0}^4 \alpha^{(k)} \left(\frac{r}{r_+} \right)^k = \frac{1}{\Delta} \sum_{k=0}^4 \alpha^{(k)} + \frac{1}{r_+(r-r_-)} \sum_{k=1}^4 \alpha^{(k)} \sum_{j=0}^{k-1} \left(\frac{r_-}{r_+} \right)^j + \frac{1}{r_+^2} \sum_{k=0}^2 \left(\frac{r}{r_+} \right)^k \sum_{j=k}^2 \alpha^{(j+2)} \sum_{n=0}^{j-k} \left(\frac{r_-}{r_+} \right)^n \quad (\text{D4})$$

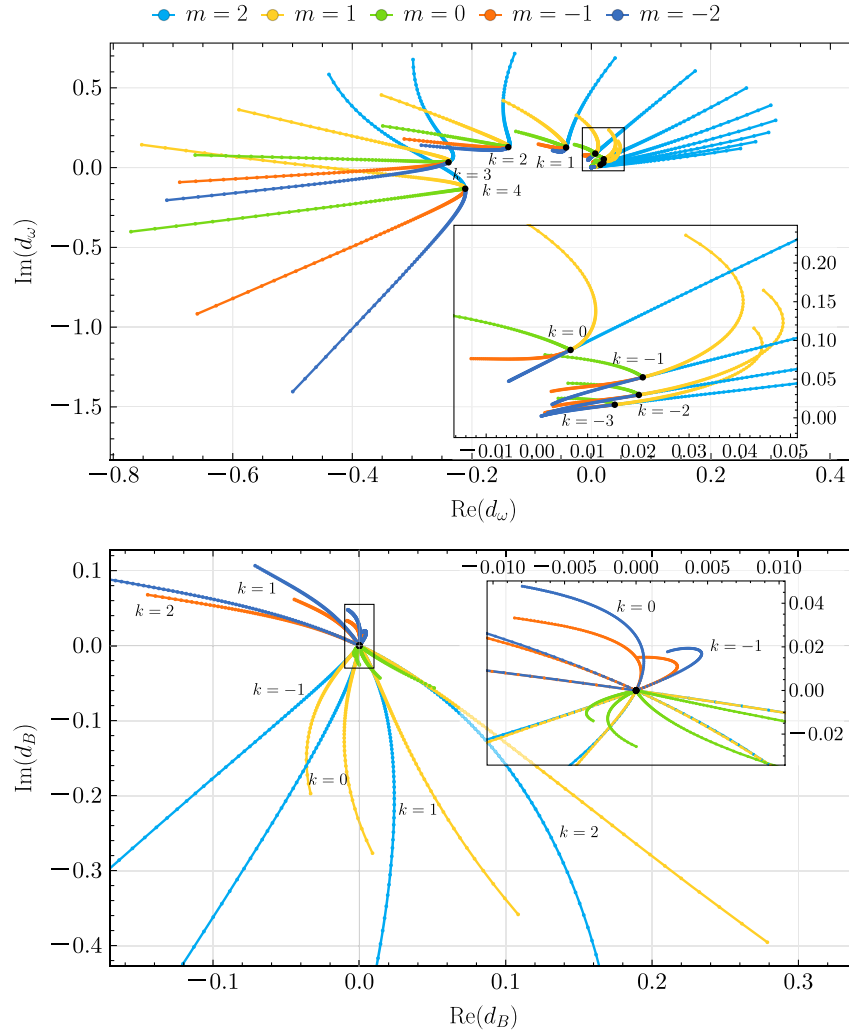


FIG. 1. In the top panel we show the real and the imaginary part of d_ω for $n = 0$, $\ell = 2$, $m = [-2, 2]$, $k = [-3, 4]$ and values of the spin from $a = 0$ to $a = 0.45$, and each point is on a step of $\delta a = 0.005$. The inset focuses around the coefficients with $k = [-3, 0]$. In the bottom panel we show the real and the imaginary part of d_B for $n = 0$, $\ell = 2$, $m = [-2, 2]$, $k = [-1, 2]$ and same values of the spin. The inset focuses around the coefficients with $m \leq 0$ and $k = [-1, 0]$. In both plots the black dot signals the coefficient value for $a = 0$.

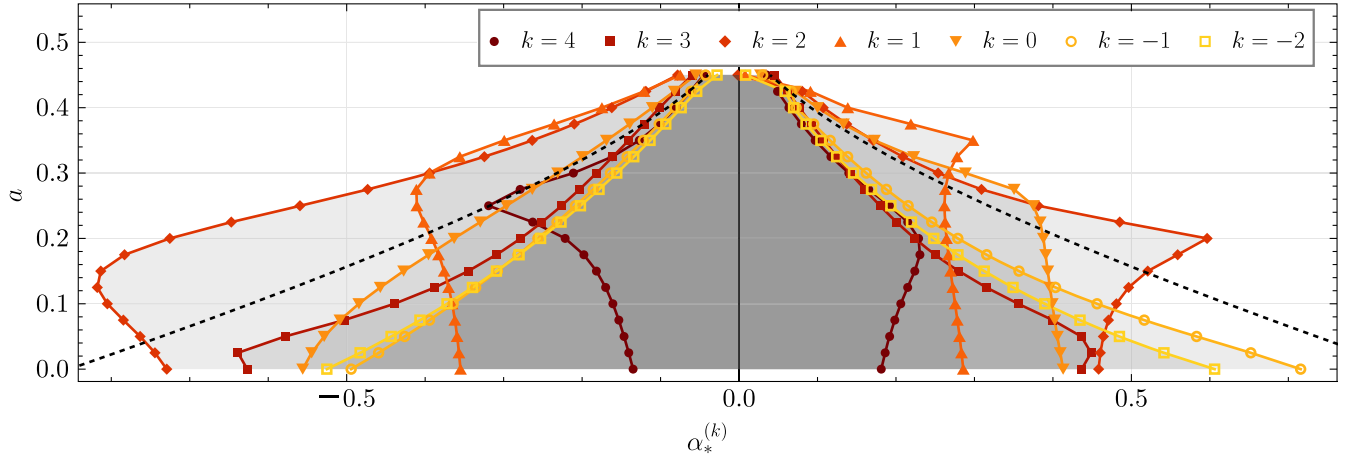


FIG. 2. We plot the threshold values $\alpha_*^{(k)}$ against the spin for different values of k . With $\alpha_*^{(k)}$, we identify the limit value of a coupling at which an error of 1% the linear and a nonlinear approximation is obtained. The plot uses as nonlinear estimates the full continued fraction results. The error is evaluated for the $n = 0, \ell = m = 2$ mode and different values of k and of the spin a . The black dashed lines correspond to the estimate (53).

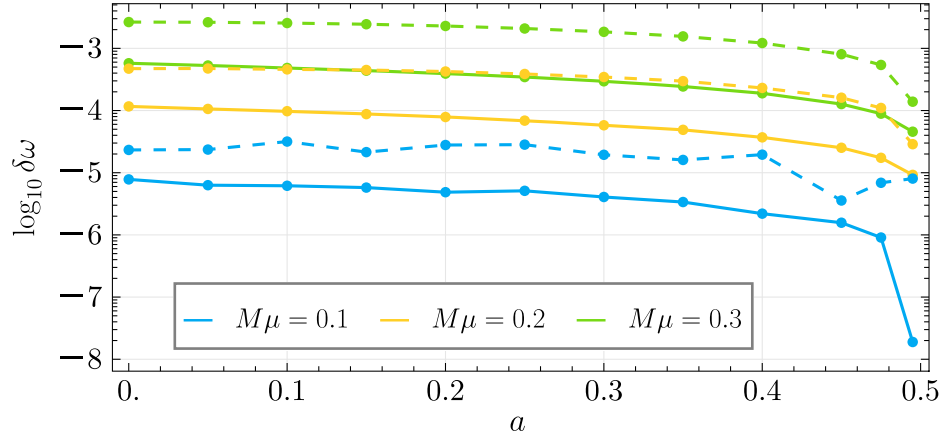


FIG. 3. Relative difference for the real part (solid line) and imaginary part (dashed line) of the fundamental $\ell = m = 2$ mode for a massive scalar perturbation computed with the linear approximation against the nonlinear results of [54].

$$\tilde{\alpha}^{(k)} = \sum_{j=k}^2 \alpha^{(j+2)} \sum_{n=0}^{j-k} \left(\frac{r_-}{r_+} \right)^n. \quad (\text{D7})$$

This modification led to a quantitative but not qualitative change of Figs. 1–3, leaving the conclusion unchanged. The updated figures are given here.

We are indebted to Alejandro Guzmán Antonucci for spotting the error.