

Σ Cos 版 NLAST: 来源 — 分数阶 非正交 Cos 基 和弦 级数展开

三味书屋



百草园

解析解 – NLCOV:

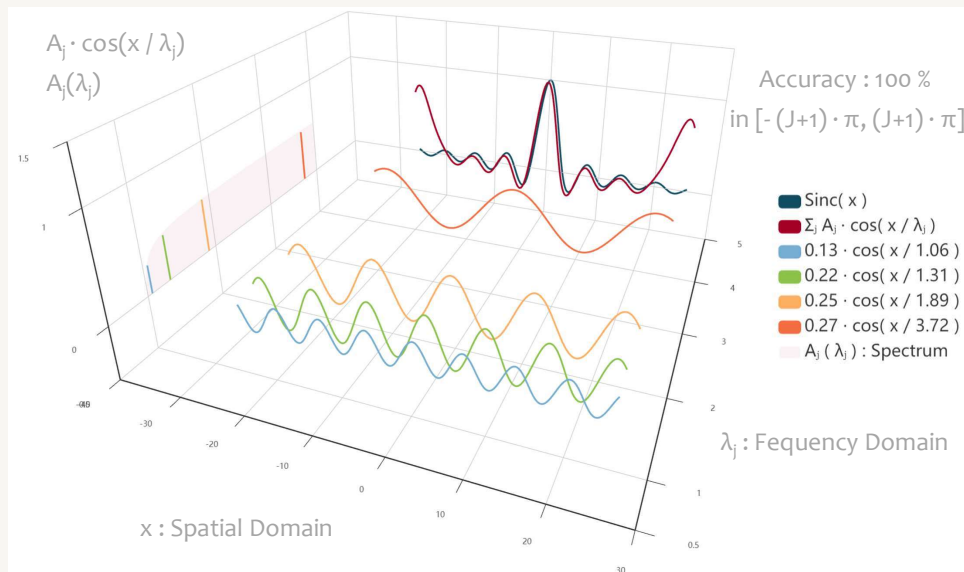
$$\iiint \mathcal{F}_{3D}[M_{\text{eff}}(\mathbf{r})] \cdot \left\{ \iint \mathcal{F}[E_{10}] \cdot \mathcal{F}[E_{20}] \cdot \frac{e^{i(k_{1z}+k_{2z}+g_z)z} - e^{ik_{3z}z}}{(k_{1z}+k_{2z}+g_z)^2 - k_{3z}^2} \cdot dk_{1x} dk_{1y} \right\} \cdot dg_x dg_y dg_z$$

依据: $\frac{e^{i\Delta k_z z} - 1}{\Delta k_z} = \text{sinc}\left(\frac{\Delta k_z z}{2}\right) \cdot e^{i\frac{\Delta k_z z}{2}} \cdot iz$

$$\text{sinc}(x) = \sum_j a_j \cos\left(\frac{x}{b_j}\right) \approx \cos\left(\frac{x}{\sqrt{3}}\right) \approx \exp\left(-\frac{x^2}{6}\right) \approx \frac{1 - \frac{7}{60}x^2}{1 + \frac{3}{60}x^2}$$

Σ Cos – NLAST:

$$\sum_j a_j \int \mathcal{F}\left[\mathcal{F}_z[M_{\text{eff}}(\mathbf{r})] \cdot E_{1\frac{b_j \pm 1}{2b_j}z} E_{2\frac{b_j \pm 1}{2b_j}z}\right] \cdot \frac{e^{ig_z \frac{b_j \pm 1}{2b_j}z}}{k_{1z} + k_{2z} + g_z + k_{3z}} \cdot dg_z \cdot e^{ik_{3z} \frac{b_j \pm 1}{2b_j}z} \cdot iz$$



1	2	3	4	5	6	7	8	9	10	
1	0.301003	0.169451	0.102129	-6.8E-05	-5E-06	-7.37E-07	-2.6E-05	1.27E-08	-1.6E-06	a ₁
	0.455351	0.298362	0.204757	0.130024	0.08661	0.064848	-2.6E-05	-9.97E-07	-1.2E-05	a ₂
		0.350258	0.260585	0.217244	0.160762	0.124482	0.076405	0.057166	2.41E-05	a ₃
			0.285946	0.251919	0.197904	0.157835	0.135342	0.105849	0.054962	a ₄
				0.265981	0.216228	0.176501	0.160369	0.131789	0.110708	a ₅
					0.224824	0.186978	0.172968	0.146336	0.136124	a ₆
						0.192352	0.179733	0.154869	0.147892	a ₇
							0.183142	0.159855	0.154058	a ₈
								0.162484	0.15737	a ₉
									0.159078	a ₁₀

1	2	3	4	5	6	7	8	9	10	
1.732051	1.14855	1.07449	1.04223	0.608268	0.574694	0.359817	0.199089	0.124246	0.029917	b ₁
	2.09636	1.45342	1.24701	1.05724	1.03632	1.02674	0.740792	0.317121	0.304177	b ₂
		2.78214	1.76697	1.30614	1.19432	1.14081	1.0315	1.02373	0.596033	b ₃
			3.4388	1.89195	1.52489	1.3628	1.16434	1.1201	1.02169	b ₄
				3.72379	2.2339	1.76762	1.40941	1.29423	1.12006	b ₅
					4.41463	2.60773	1.84433	1.57993	1.30273	b ₆
						5.169	2.73596	2.07484	1.60011	b ₇
							5.43949	3.08289	2.11118	b ₈
								6.13366	3.14693	b ₉
									6.27256	b ₁₀