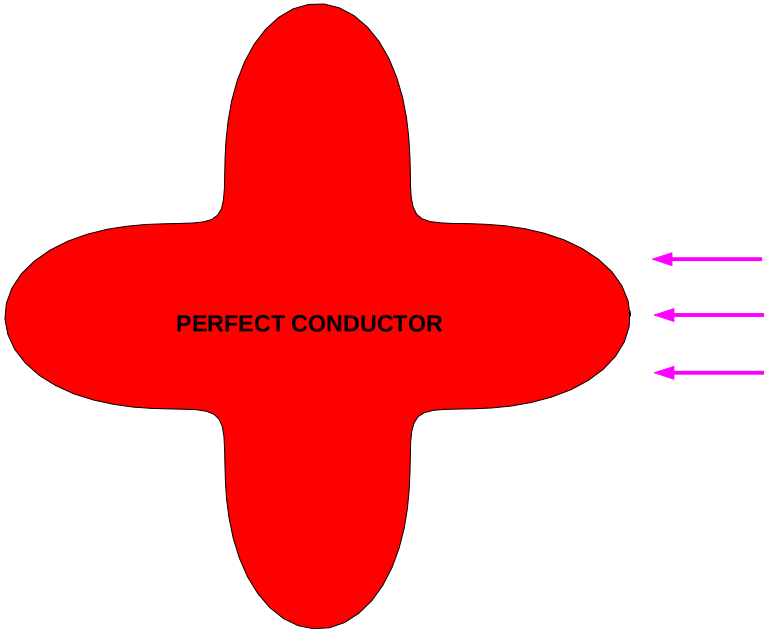


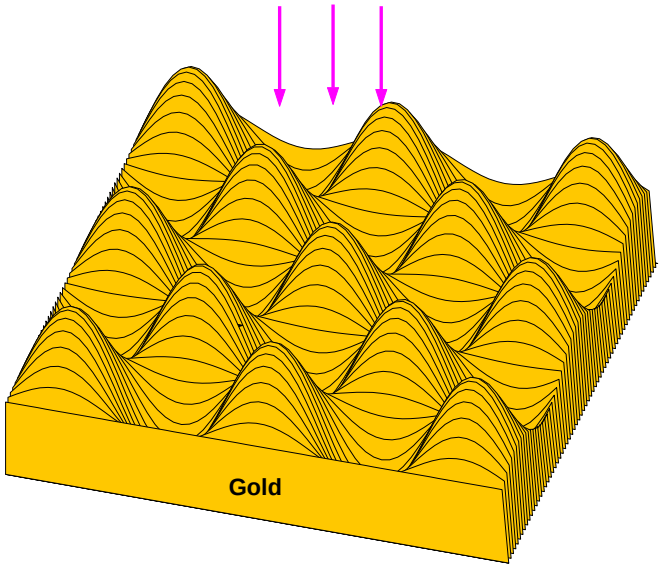
— $\rho = 1 + h/2\cos(4\theta)$, $h = 0.75$

— TE polarization

— $\epsilon = \dfrac{\left|\sum_r |B_r|^2 + \mathrm{Re}\left(\sum_r B_r\right)\right|}{\sum_r |B_r|^2}$

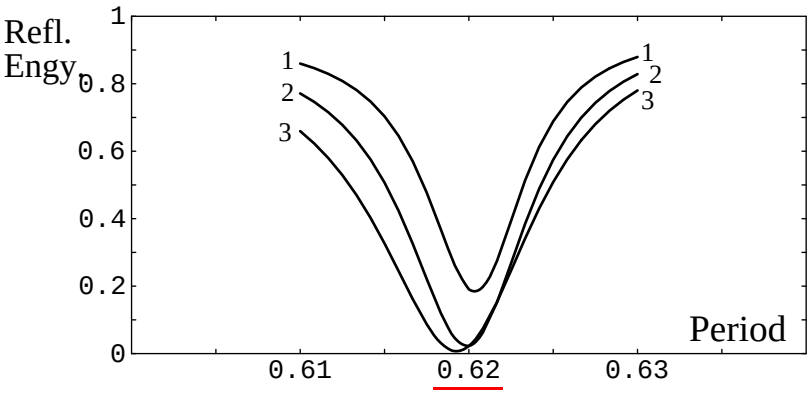
— [29/29] Padé approximants

P/λ	BSCS	FSCS	Energy	ϵ
5	4.448e+00	2.868e+01	4.911e+00	5e–09
10	6.453e+00	6.072e+01	1.024e+01	6e–08
15	7.691e+00	8.916e+01	1.519e+01	2e–06
20	7.984e+00	1.128e+02	1.974e+01	4e–05
25	7.338e+00	1.388e+02	2.453e+01	2e–04



— Bi-sinusoidal, gold

— Normal incidence, $\lambda = 0.65\mu$m



— **1.** $h = 0.040\mu$m

— **2.** $h = 0.055\mu$m

— **3.** $h = 0.070\mu$m

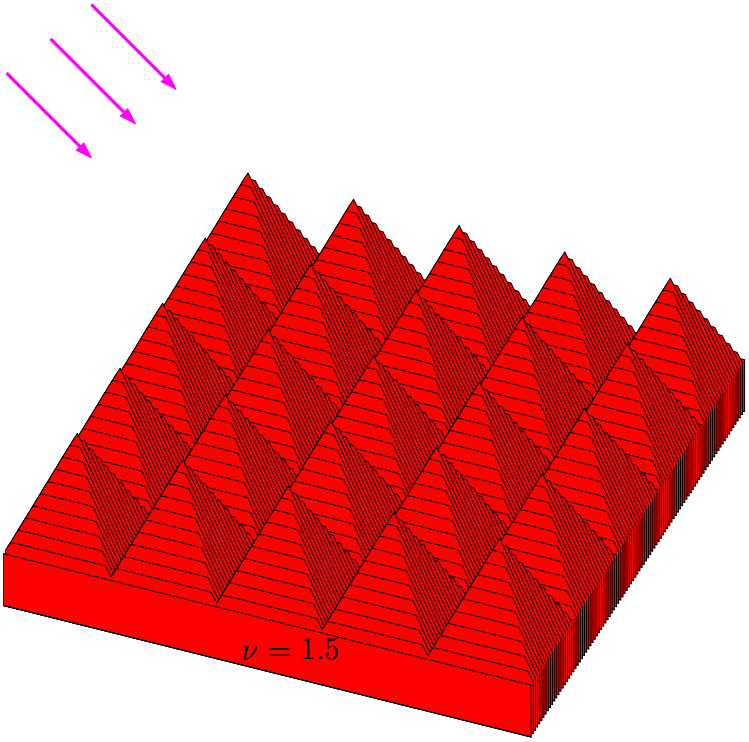
— [6/6] Padé approximants

Convergence study:

— $d = 0.62\,\mu$m

— $\left[\frac{n-1}{2}/\frac{n-1}{2}\right]$ Padé approximants

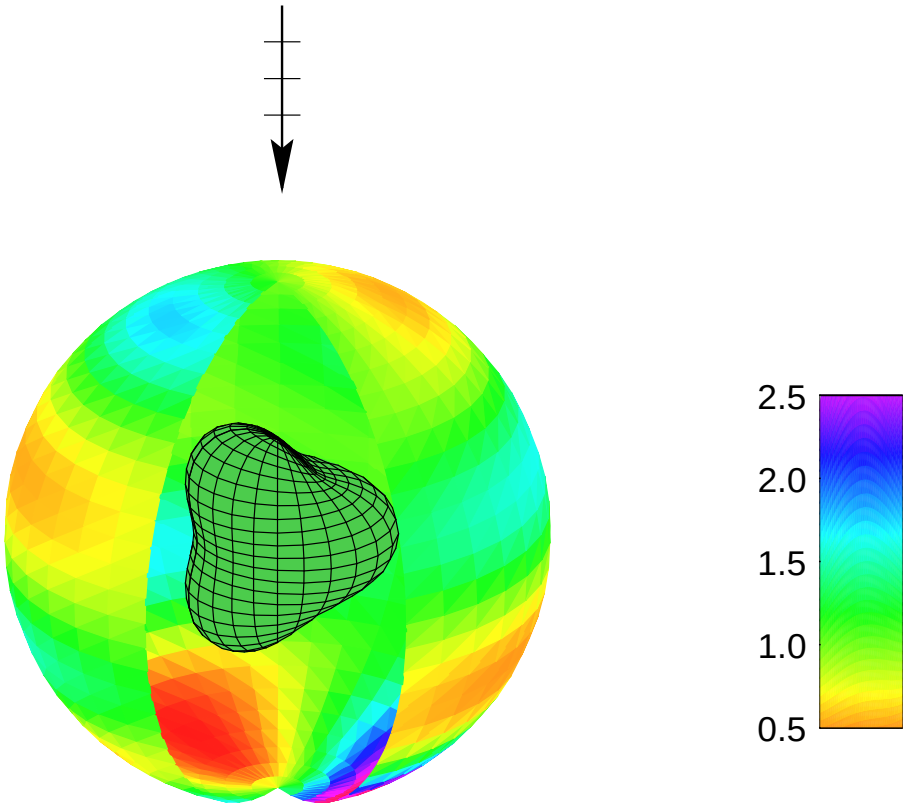
n	$h = 0.055\mu m$	$h = 0.070\mu m$	$h = 0.500\mu m$
13	0.0227882361359963	0.0226057361431067	0.84146746
17	0.0227882361334883	0.0226057359874209	0.84202623
21	0.0227882361334891	0.0226057359874838	0.84219841
25	0.0227882361334900	0.0226057359874644	0.84260919
29	0.0227882361334896	0.0226057359874220	0.84197301
33	0.0227882361334896	0.0226057359874253	0.84197398



— Array of pyramids
— Periods: $d_1 = 1.5\mu$m, $d_2 = 1.0\mu$m
— $\nu = 1.5$, $\lambda = 1.533\mu$m
— Oblique incidence

— [4/4] Padé approximants

h	$e_{r,0,0}$	$e_{r,-1,0}$	$e_{t,0,0}$	$e_{t,1,0}$	$e_{t,-1,0}$	$e_{t,0,-1}$	$e_{t,-1,-1}$	ϵ
0.00	0.02525	0.00000	0.97475	0.00000	0.00000	0.00000	0.00000	-1E-16
0.05	0.02500	0.00010	0.97432	0.00012	0.00013	0.00029	0.00004	-2E-12
0.10	0.02425	0.00041	0.97306	0.00049	0.00050	0.00115	0.00015	-8E-10
0.15	0.02304	0.00092	0.97099	0.00107	0.00110	0.00256	0.00032	-2E-08
0.20	0.02143	0.00161	0.96817	0.00185	0.00192	0.00445	0.00056	-2E-07
0.25	0.01951	0.00246	0.96465	0.00280	0.00294	0.00679	0.00086	-1E-06
0.30	0.01737	0.00341	0.96051	0.00388	0.00415	0.00948	0.00120	-6E-06
0.35	0.01511	0.00441	0.95582	0.00506	0.00553	0.01247	0.00157	-2E-05
0.40	0.01284	0.00540	0.95068	0.00631	0.00709	0.01567	0.00196	-5E-05
0.45	0.01064	0.00633	0.94515	0.00758	0.00882	0.01901	0.00237	-1E-04
0.50	0.00858	0.00713	0.93933	0.00885	0.01070	0.02241	0.00278	-2E-04



— $\rho = a + \delta f(\theta, \phi),\ ka = 1$

— $f(\theta, \phi) = \frac{3}{8}\cos(\phi)\sin(\theta)\left(4 - 5\sin^2(\theta)\right)$

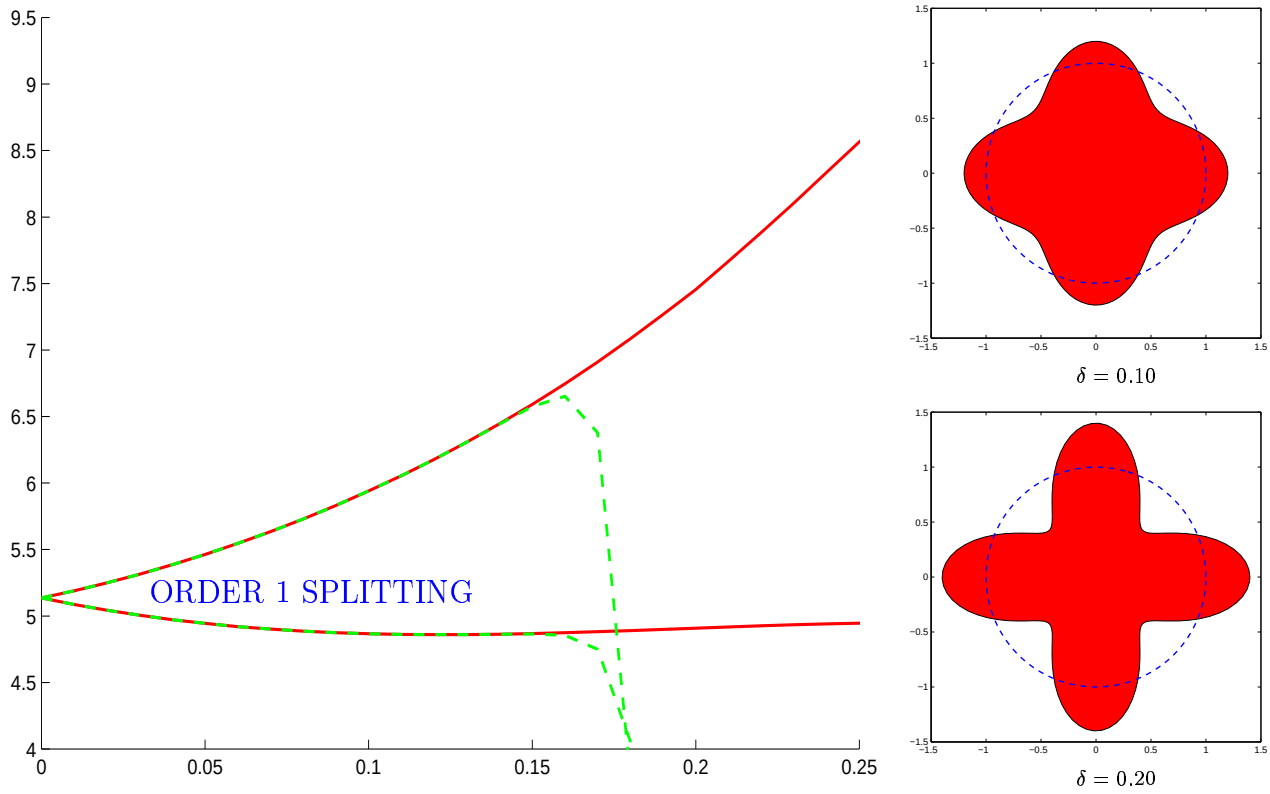
— Far field for $\delta = 0.5$

— $\epsilon = \dfrac{\left|\sum_{r,s} \alpha_{r,s}|B_{r,s}|^2 + \mathrm{Re}\left(\sum_{r,s} \alpha_{r,s}\overline{A_{r,s}}B_{r,s}\right)\right|}{\sum_r \alpha_{r,s}|B_{r,s}|^2}$

— [5/5] Padé approximants

Padé	δ	$B_{0,0}$	Energy	ϵ (Taylor)	ϵ (Padé)
[5/5]	1.0	–0.776–0.383 i	2.0208911	Diverges	1.6E–04
[5/5]	0.5	–0.730–0.435 i	1.7853305	2.5E–03	5.3E–07

• EIGENVALUE PROBLEMS



Continuation of the zero $z = 5.1356223$ of $J_2(z)$ as eigenfrequencies for perturbations $f(\theta) = 2\cos(4\theta)$. Dashed green: Taylor series (order 28); solid red: Padé [14/14].

Convergence study:

N	δ	Padé $([N/2, N/2])$	Taylor (N)
4	0.10	5.932459814	5.933746721
8	0.10	5.939888161	5.939685615
12	0.10	5.940103147	5.940002737
16	0.10	5.940063852	5.940052067
20	0.10	5.940063913	5.940061333
24	0.10	5.940063912	5.940063302
28	0.10	5.940063912	5.940063758

N	δ	Padé $([N/2, N/2])$	Taylor (N)
4	0.20	7.250946252	7.290785243
8	0.20	7.430618958	7.338717672
12	0.20	7.476836436	7.147414978
16	0.20	7.459583127	6.463497406
20	0.20	7.462505263	2.837427216
24	0.20	7.462303523	Diverges