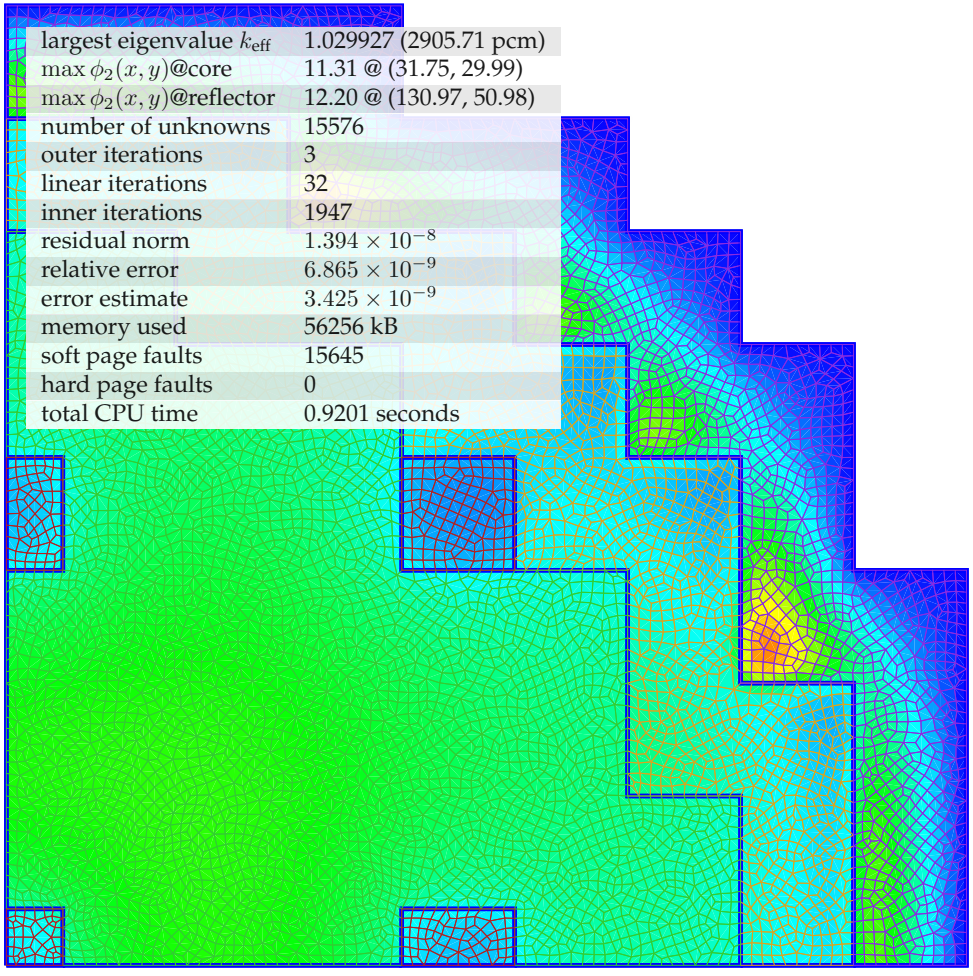
milonga's 2D LWR IAEA Benchmark Problem case #013

quarter-symmetry core meshed using delaunay (quads, ℓ_c =2) solved with finite volumes

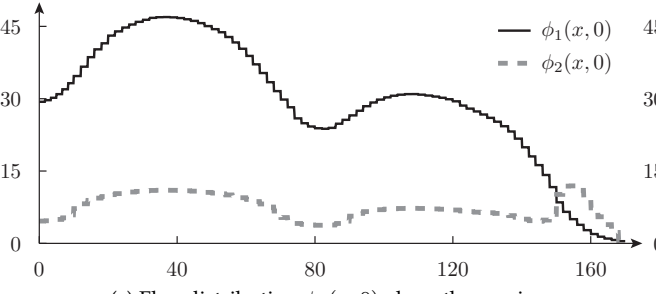


largest eigenvalue k_{eff}	1.029927 (2905.71 pcm)
$\max \phi_2(x,y)$@core	11.31 @ (31.75, 29.99)
$\max \phi_2(x,y)$@reflector	12.20 @ (130.97, 50.98)
number of unknowns	15576
outer iterations	3
linear iterations	32
inner iterations	1947
residual norm	1.394×10^{-8}
relative error	6.865×10^{-9}
error estimate	3.425×10^{-9}
memory used	56256 kB
soft page faults	15645
hard page faults	0
total CPU time	0.9201 seconds

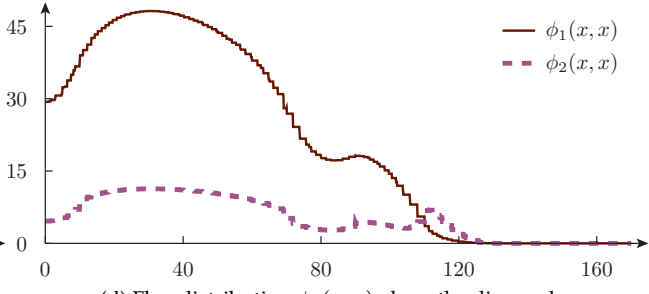
(a) Mesh and thermal flux distribution

k	P_k	ϕ_{1k}	ϕ_{2k}
1	0.74	32.44	5.49
2	1.33	42.30	9.82
3	1.47	46.51	10.92
4	1.24	39.46	9.17
5	0.60	26.45	4.43
6	0.94	29.97	6.96
7	0.93	29.38	6.91
8	0.74	20.05	5.45
9	—	3.01	7.46
10	1.45	45.88	10.76
11	1.50	47.20	11.08
12	1.33	41.98	9.84
13	1.09	34.65	8.05
14	1.04	32.80	7.69
15	0.95	29.86	7.04
16	0.71	19.62	5.28
17	—	2.93	7.15
18	1.48	46.80	10.98
19	1.36	42.88	10.07
20	1.19	37.55	8.81
21	1.07	33.85	7.96
22	0.97	29.05	7.21
23	0.67	16.53	4.93
24	—	2.20	5.56
25	1.21	38.08	8.93
26	0.98	31.15	7.24
27	0.92	28.89	6.80
28	0.83	22.47	6.15
29	—	5.43	12.41
30	—	0.67	2.60
31	0.45	19.77	3.30
32	0.69	20.76	5.09
33	0.58	14.60	4.28
34	—	2.26	5.74
35	0.56	13.64	4.13
36	—	3.71	8.21
37	—	0.52	2.00
38	—	0.60	2.38

(b) Power and fluxes



(c) Flux distribution $\phi_g(x,0)$ along the x axis



(d) Flux distribution $\phi_g(x,x)$ along the diagonal