

Table 5. The "1342" OUT-IN scheme & the "2341" LLLP scheme characteristics for the first case (e=4.4 %).

NRV neutron flux decrease	FA power decrease	Fluence decrease	Fluence	Peak Power	Cycle Time MONTH	K_{eff}	Load-up Type →		
0.37	0.26	0.31	3.6E+18	1.24	9.80	1.04948	BOC	OUT-IN	1342
				1.29		0.96679	EOC		
			2.4E+18	1.46	9.98	1.0529	BOC	LLLP	2341
				1.38		0.9828	EOC		
0.31	0.25	0.3	7.27E+19	1.41	9.72	1.05352 [14]	Referenced value		
[10] [23]	[1]	[10] [23]	[24]	[16]	[22]	0.969 [15]			

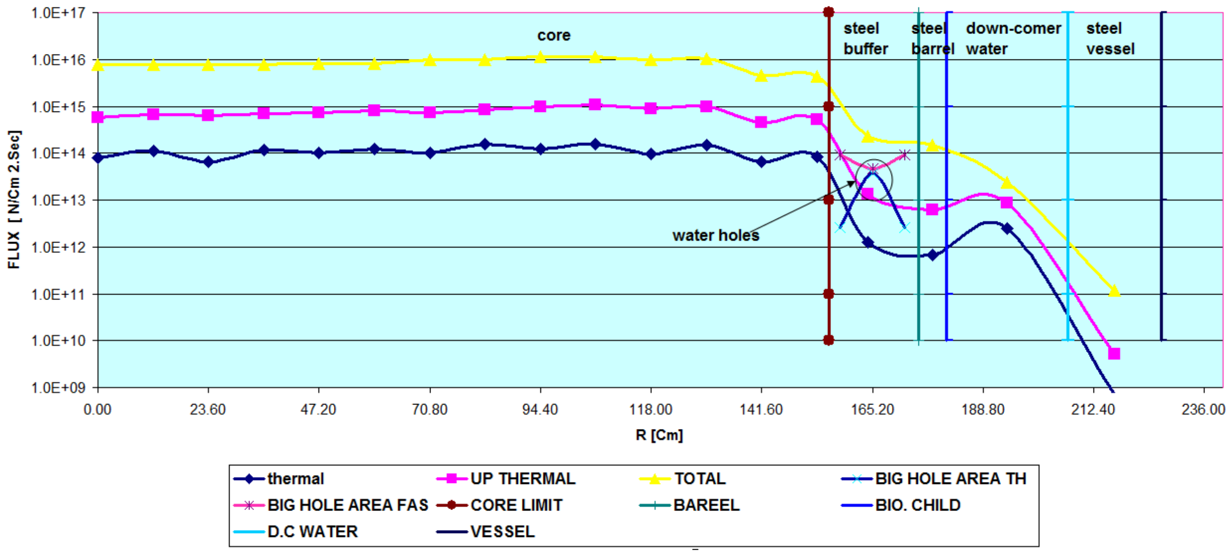

Figure 8. The thermal, up thermal and fast neutron flux distributions over the core for e=4.4% and LLLP "2341".

Second case e=5.2%

Following the same argument for the proposed case (e=5.2%), we distinguish the "13524" LLLP scheme, with the best (0.69x10^{11} n/cm^2.s) flux and a corresponding Pq value of 1.45 (Figure 9).

Figure 10 depicts the thermal, up thermal and fast neutron flux distributions over the reactor for the selected scheme; namely LLLP "13524".

Finally, it is worth mentioning that Tallies F4, *F4, F7 and *F7 were used to calculate neutron flux densities in different core cells and power in fuel cells. The obtained power distributions were used to obtain radial peak power (Pq). The RV neutron flux was obtained using F2 tally for internal reactor vessel surface for fast neutrons (> 0.5 MeV). The results were used to get a sectional distribution of neutron flux through the core and the surrounding components as shown in Figures 8 and 10.

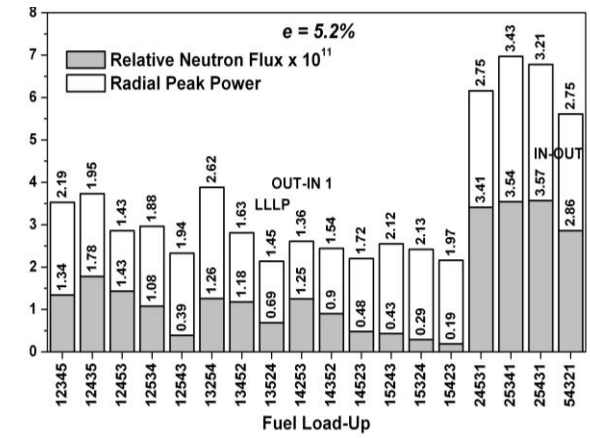

Figure 9: Comparison of different fuel load-up schemes according to Pq and RV neutron flux (e=5.2 %).