COST ANALYSIS OF LOCAL ASSEMBLY (LEFT HAND SIDE)

HELMHOLTZ 2D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.374	0.392	0.356	0.358	/	/	
2	0.414	0.388	0.364	0.383	/	/	0.368
3	0.395	0.333	0.285	0.294	/	/	0.287
4	0.364	0.292	0.196	0.222	0.197	0.2	0.208

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}
1	5.00%	0.00%
2	12.00%	0.00%
3	28.00%	0.00%
4	46.00%	0.00%

HELMHOLTZ 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.608	0.54	0.546	0.507	/	/	0.53
2	1.021	0.688	0.588	0.605	/	/	0.637
3	0.55	0.362	0.377	0.375	0.37	0.371	0.364
4	0.903	0.497	0.34	0.362	0.339	0.342	0.319

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}
1	16.00%	1.85%
2	43.00%	0.00%
3	35.00%	0.00%
4	65.00%	8.00%

HELMHOLTZ XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.429	0.284	0.276	0.273	/	/	0.284
2	1.708	1.25	1.039	1.034	1.007	0.996	0.983
3	3.311	1.898	1.906	1.984	1.885	1.857	1.832
4	6.153	3.412	2.863	3.637	2.722	2.691	2.48

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	36.36%	0.00%	
2	42.45%	5.39%	OP+UAJ
3	44.67%	3.48%	OP+UAJ
4	59.69%	13.38%	OP+UAJ

For the following advection diffusion problem, we consider the assembly cost of the diffusion kernel
ADVDIFF 2D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.092	0.096	0.087	0.092			
2	0.4	0.356	0.353	0.349	/	/	0.345
3	0.371	0.307	0.278	0.287	/	/	0.275
4	0.341	0.264	0.184	0.205	/	/	0.189

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}
1		
2	13.75%	2.27%
3	25.88%	1.08%
4	46.04%	0.00%

ADVDIFF 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.535	0.468	0.467	0.475	/	/	0.468
2	0.958	0.629	0.542	0.564	/	/	0.545
3	0.507	0.328	0.336	0.359	0.334	0.332	0.331
4	0.82	0.378	0.298	0.321	0.287	0.287	0.265

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	12.71%	0.00%	
2	43.42%	0.00%	
3	35.31%	0.00%	
4	67.68%	11.07%	OP+UAJ

ADVDIFF XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.402	0.282	0.268	0.274	/	/	0.269
2	0.391	0.289	0.235	0.257	0.237	0.229	0.234
3	0.767	0.429	0.433	0.468	0.426	0.421	0.401
4	1.379	0.733	0.652	0.846	0.607	0.78	0.528

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	33.33%	0.00%	
2	41.43%	2.55%	OP+UAJ
3	47.72%	6.53%	OP+UAJ
4	61.71%	19.02%	OP+UAJ

BURGERS 2D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	8.685	7.169	6.977	6.863	/	/	7.096
2	2.779	2.108	1.975	1.951	2.016	2.013	2.04
3	11.727	6.979	6.901	6.95	7.052	6.811	6.904
4	13.769	7.377	6.872	6.439	6.581	6.454	6.667

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}
polynomial order		
1	21.00%	2.00%
2	29.00%	0.00%
3	41.00%	2.00%
4	53.00%	7.00%

BURGERS 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.63	0.508	0.518	0.507	0.542	0.519	0.509
2	1.668	0.892	0.94	0.785	0.839	0.769	0.818
3	2.059	1.258	1.345	1.166	1.28	1.16	1.281
4	17.916	11.584	10.493	10.449	10.078	8.81	9.53

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
polynomial order			
1	20.00%	0.00%	/
2	54.00%	13.79%	TILE16+SPLIT3
3	44.00%	7.79%	TILE24+SPLIT9
4	55.00%	16.04%	TILE24+SPLIT9

BURGERS XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.434	0.309	0.301	0.275	0.288	0.276	0.282
2	5.019	2.339	2.26	1.979	2.147	1.96	2.066
3	6.623	4.262	4.589	3.818	4.354	3.848	4.199
4	1.6	1.185	1.153	0.771	1.028	0.833	0.933

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}
polynomial order		
1	36.64%	8.64%
2	60.95%	13.27%
3	42.35%	10.42%
4	51.81%	33.13%