COST ANALYSIS OF LOCAL ASSEMBLY (LEFT HAND SIDE)

HELMHOLTZ 2D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.164	0.156	0.124	0.121	/	/	/
2	0.17	0.116	0.09	0.093	/	/	0.091
3	0.204	0.121	0.071	0.09	/	/	0.074
4	0.273	0.163	0.066	0.092	0.067	/	0.079

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	26.22%	2.42%	SPLIT1
2	47.06%	0.00%	
3	65.20%	0.00%	
4	75.82%	0.00%	

HELMHOLTZ 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.232	0.17	0.171	0.151	/	/	0.157
2	0.651	0.31	0.196	0.212	/	/	0.206
3	0.338	0.128	0.127	0.134	0.128	0.124	0.124
4	0.827	0.365	0.253	0.26	0.238	0.239	0.227

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	34.91%	11.18%	VECT1
2	69.89%	0.00%	
3	63.31%	3.13%	VECT2
4	72.55%	10.28%	VECT2

HELMHOLTZ XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.292	0.135	0.111	0.115	/	/	0.11
2	1.19	0.522	0.434	0.444	0.436	0.424	0.406
3	2.496	1.018	1.028	1.103	1	1.074	0.95
4	5.524	2.681	2.008	2.797	1.874	2.46	1.62

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	62.33%	0.90%	
2	65.88%	6.45%	VECT1
3	61.94%	7.59%	VECT2
4	70.67%	19.32%	VECT1

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	0.15	0.137	0.109	0.112	/	/	/
2	0.151	0.09	0.076	0.076	/	/	0.076
3	0.181	0.092	0.059	0.071	/	/	0.06
4	0.227	0.138	0.053	0.078	0.053	0.074	0.056

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}
1	27.33%	0.00%
2	49.67%	0.00%
3	67.40%	0.00%
4	76.65%	0.00%

ADVDIFF 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.217	0.167	0.153	0.155	/	/	0.146
2	0.597	0.271	0.161	0.191	/	/	0.167
3	0.296	0.095	0.093	0.117	0.094	0.111	0.091
4	0.742	0.285	0.194	0.215	0.19	0.211	0.167

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	32.72%	4.58%	VECT1
2	73.03%	0.00%	
3	69.26%	2.15%	
4	77.49%	13.92%	VECT2

ADVDIFF XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.25	0.116	0.098	0.106	/	/	0.097
2	0.26	0.143	0.083	0.102	0.083	0.096	0.081
3	0.566	0.209	0.207	0.235	0.199	0.228	0.176
4	1.204	0.518	0.448	0.631	0.398	0.563	0.318

Percentage Reductions

polynomial order	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
1	61.20%	1.02%	VECT1
2	68.85%	2.41%	VECT3
3	68.90%	14.98%	VECT3
4	73.59%	29.02%	VECT3

BURGERS 2D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.75	0.49	0.48	0.437	/	/	0.467
2	0.273	0.151	0.12	0.113	0.121	0.112	0.12
3	1.5	0.56	0.575	0.567	0.56	0.572	0.595
4	1.87	0.76	0.675	0.61	0.66	0.6	0.64

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}	
polynomial order			
1	41.73%	8.96%	SPLIT1
2	58.97%	6.67%	TILE8_SPLIT6
3	62.67%	0.00%	
4	67.91%	11.11%	TILE8_SPLIT6

BURGERS 3D

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.121	0.075	0.075	0.069	0.077	0.071	0.11
2	0.65	0.29	0.31	0.238	0.256	0.223	0.247
3	0.93	0.549	0.582	0.501	0.55	0.5	0.55
4	8.52	5.36	4.79	4.445	4.63	4.14	4.46

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}		
polynomial order				
1	42.98%	8.00%	SPLIT3	
2	65.69%	23.10%	TILE16_SPLIT3	SPLIT3
3	46.24%	8.93%	TILE16_SPLIT9	SPLIT9
4	51.41%	13.57%	TILE24_SPLIT9	SPLIT9

BURGERS XTR

	ORIGINAL	LICM	LICM_AP	SPLIT	TILE	TILE+SPLIT	OP+UAJ
polynomial order							
1	0.057	0.027	0.026	0.02	0.023	0.02	0.022
2	0.22	0.1	0.095	0.078	0.085	0.077	0.88
3	0.308	0.185	0.188	0.161	0.2	0.166	0.181
4	0.766	0.58	0.54	0.36	0.482	0.388	0.44

Percentage Reductions

	w.r.t. ORIGINAL	w.r.t LICM_{AP}		
polynomial order				
1	64.91%	23.08%	SPLIT3	ΓILE12_SPLIT3
2	65.00%	18.95%	SPLIT9	ΓILE24_SPLIT9
3	47.73%	12.97%	SPLIT9	TILE8_SPLIT9
4	53.00%	33.33%	SPLIT9	TILE8_SPLIT9