

QDP/C Update and Tutorial

SciDAC All Hands Meeting

BNL

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download QDP code and MILC/QDP patches at:

<http://www.physics.utah.edu/~osborn>

“vector” calls

The function

```
QDP_ColorVector *dest[n], *vec[n];
QDP_ColorMatrix *mat[n];
QDP_Subset subset;

QDP_V_vpeq_M_times_V(dest, mat, vec, subset, n);
```

gives the same result as

```
for(i=0; i<n; i++)
    QDP_V_peq_M_times_V(dest[i], mat[i], vec[i], subset);
}
```

but actually does something like

```
offset = 0;
do {
    for(i=0; i<n; i++)
        QDP_V_peq_M_times_V(dest[i], mat[i], vec[i], subset(offset, block_size) );
    }
    offset += block_size;
} while(offset<subset_length);
```

get and set block size with

```
int QDP_get_block_size(void);
void QDP_set_block_size(int);
```

multisubset calls

The function

```
QLA_Real dest;  
QDP_ColorVector *src;  
QDP_Subset subset;  
  
QDP_r_eq_norm2_V( &dest, src, subset );
```

becomes

```
QLA_Real dest[n];  
QDP_ColorVector *src;  
QDP_Subset subsets[n];  
  
QDP_r_eq_norm2_V_multi( dest, src, subsets, n );
```

and we will also have

```
QLA_Real dest[n];  
QDP_ColorVector *src[n];  
QDP_Subset subsets[n];  
  
QDP_r_veq_norm2_V( dest, src, subsets[0], n );  
  
QDP_r_veq_norm2_V_multi( dest, src, subsets, n );
```

Profiling

```
#define QDP_PROFILE
#include <qdp.h>
```

gives on stdout at end of run something like

QDP function	count	time (ms)	us per call	ns per site	caller:line
QDP_I_eq_func	1	3	3095	756	main:121
QDP_S_eq_seed_i_I	1	1	549	134	main:122
QDP_F3_M_eq_func	4	20	5057	1235	main:128
QDP_F3_V_eq_func	1	4	3587	876	main:136
QDP_F3_V_eq_gaussian_S	1	11	10993	2684	main:145
QDP_F3_r_eq_norm2_V	1	0	184	45	main:149
QDP_F3_r_eq_norm2_V	1	0	145	71	congrad:30
QDP_F3_r_eq_norm2_V	1	0	128	63	congrad:36
QDP_F3_V_eq_V	20	3	155	76	dslash:94
QDP_F3_V_veq_sV(no restart)	2	2	816	100	dslash:100
QDP_F3_V_veq_sV(restart)	18	0	8	1	dslash:100
QDP_F3_V_veq_Ma_times_V	20	38	1876	229	dslash:104
QDP_F3_V_veq_sV(no restart)	2	1	451	55	dslash:116
QDP_F3_V_veq_sV(restart)	18	0	7	1	dslash:116
QDP_F3_V_eq_zero	20	2	122	59	dslash:128
QDP_F3_V_vpeq_M_times_V	20	33	1665	203	dslash:129
QDP_F3_V_vmeq_V	20	10	494	60	dslash:136
QDP_F3_V_meq_r_times_V	1	0	113	55	congrad:43
QDP_F3_V_peq_V	1	0	100	49	congrad:44
QDP_F3_V_eq_V	1	0	98	48	congrad:45
QDP_F3_r_eq_norm2_V	1	0	61	30	congrad:46
QDP_F3_V_meq_r_times_V	9	1	108	53	congrad:58
QDP_F3_r_eq_re_V_dot_V	9	1	63	31	congrad:60
QDP_F3_V_peq_r_times_V	9	1	91	44	congrad:62
QDP_F3_V_peq_r_times_V	9	1	112	55	congrad:63
QDP_F3_r_eq_norm2_V	9	0	44	21	congrad:64
QDP_F3_V_eq_r_times_V_plus_V	9	1	80	39	congrad:67