

USQCD Propagator Formats

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Overview

- Documentation URL (Appendix A.2)

http://usqcd.jlab.org/usqcd-docs/qio/qio_2p3.pdf

- Four formats: General description (Dirac propagators)
 1. C1D12: One complex scalar source record and twelve solution records, one for each source spin and color. The solution records correspond to each source spin and color. The order of source spin and color should be sequential with color varying most rapidly.
 2. CD_PAIRS: Alternating source and solution for any number of pairs. The source in each case is a complex field.
 3. DD_PAIRS: Alternating source and solution for any number of pairs. The source in each case is a Dirac field.
 4. LHPC: [USQCD standard under development.]

QIO supports fields defined over one time slice.

- SciDAC QIO-friendly (lots of QIO support), but LIME underneath.
- USQCD also has the analogous staggered fermion propagator formats.

General QIO file organization

- Series of logical QIO records
 - File info
 - Record info plus payload
 - Record info plus payload
 - ... (unlimited)
- Record info plus payload: four LIME records
 - Private record info
 - User record info
 - Binary payload
 - Checksum for payload
- Each LIME record has a unique LIME type.
Helps if non-QIO software reads the file.

User file info

```
<?xml version="1.0" encoding="UTF-8"?>
  <usqcdPropFile>
    <version>1.0</version>
    <type>(type string)</type>
    <info>(information)</info>
  </usqcdPropFile>
```

where the “type string” is

"USQCD_DiracFermion_ScalarSource_TwelveSink"

"USQCD_DiracFermion_Source_Sink_Pairs"

"USQCD_DiracFermion_ScalarSource_Sink_Pairs"

"LHPC_DiracPropagator"

and the “information” is any XML the user desires.

So a file reader can distinguish among file formats.

User record info for source and solution

- Source

```
<?xml version="1.0" encoding="UTF-8"?>
<usqcdSourceInfo>
  <version>1.0</version>
  <info> (information) </info>
</usqcdSourceInfo>
```

- Solution

```
<?xml version="1.0" encoding="UTF-8"?>
  <usqcdPropInfo>
    <version>1.0</version>
    <spin>(spin)</spin>
    <color>(color)</color>
    <info>(information)</info>
  </usqcdPropInfo>
```

“Spin” and “color” are required only for C1D12 (but not enforced) and “information” is any XML the user wants.