FIELD is presented. The red icons or groups can be repeated in the text. string denotes a string of characters. The reference directory in the In the following, a general format for the input file of MITHRA int stands for an integer number, real represents a real value, and path locations is the path where the simulation is started. In other = < ( real, real, real ) > < ( real, real, real ) > real, real, real ) > real ) real ) < ( real, real, real ) < uniform | gaussian > real, real, real) words, "./" points to the location where the project is called. = < true | false > = < true | false > = < ( real, real,</pre> (real, real, FEMTOSECOND ATTOSECOND > MILLISECOND MICROSECOND = < NSFD | FD > NANOSECOND 3D-crystal NANOMETER | ellipsoid | DECIMETER | CENTIMETER MILLIMETER PICOSECOND MICROMETER ANGSTROM > SECOND | = < string > = < manual | = < 1 | 2 > METER = < real > = < real > real | = < real > = < real > file > < real > = < real > = < real > = < int > optimize-bunch-position initial-time-back-shift mesh-truncation-order number-of-particles bunch-initialization sigma-momentum sigma-position mesh-resolution bunch-time-step total-distance distribution length-scale mesh-lengths space-charge mesh-center file-name direction time-scale total-time position charge gamma solver

```
distance-to-bunch-head
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            static-undulator-array
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             undulator-parameter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  undulator-parameter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  polarization-angle
                                                                                                                                                                                                       Field-visualization
                                                                                                                                                          number-of-points
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tatic-undulator
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Field-profile
                                                                                                                            line-begin
                                                                                                                                                                                                                                                                                                                                                                                                base-name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       base-name
                                                              directory
                                                                              base-name
                                                                                                                                                                                                                                                                                                                                                                                  directory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          directory
                                                                                                            position
                                                                                                                                         line-end
                                                                                                                                                                                                                                                                                   position
                                                                                            rhythm
                                                                                                                                                                                                                                                                                                                                                                                                                 rhythm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rhythm
                                                                                                                                                                                                                                        samble
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sample
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  period
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                offset
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UNDULATOR
                                                                                                                                                                                                                                                                       plane
                                                                                                                                                                                                                                                                                                     Field
                                                                                                                                                                                                                                                       type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          = < over-line | at-point >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     = < ( real, real, real ) >
               = < real between 0 and 1 >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         = < ( real, real, real ) >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          confined-plane-wave |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    = < neumann | gaussian |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       = < ( real, real, real )
                                                                                                                                         = < /path/to/location >
                                                                                                                                                                                                                                                                   = < /path/to/location >
                                                                                                                                                                                                                                                                                                                                                                                                = < /path/to/location >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     secant-hyperbolic |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gaussian-beam >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             = < true | false >
                                                                                                                                                                                                                                                                                                                                                                                 = < true | false >
                                              = < true | false >
                                                                                                                           = < true | false >
                                                                                                                                                                                                                                                      = < true | false >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            = < Ex | Ey | Ez |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           = < plane-wave |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     flat-top >
                                                                                                                                                         = < string >
                                                                                                                                                                                                                                                                                   = < string >
                                                                                                                                                                                                                                                                                                                                                                                                               = < string >
                              = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                              = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                          = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               = < real >
                                                                                                                                                                         = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  = < real >
longitudinal-truncation = < real >
                                                                                                                                                                                                                                                                                                     = < real >
                              bunching-factor-phase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    radius-perpendicular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            field-initialization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     strength-parameter
                                                                                                                                                                                                                       bunch-visualization
              bunching-factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       radius-parallel
                                                                                            bunch-sampling
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       polarization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pulse-length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               field-sampling
                                                                                                                                                                                                                                                                                                                                                  bunch-profile
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       signal-type
                                               shot-noise
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  wavelength
                                                                                                                                                                                                                                                                                                                                                                                                               base-name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       direction
                                                                                                                                                          base-name
                                                                                                                                                                                                                                                                    directory
                                                                                                                                                                                                                                                                                    base-name
                                                                                                                                                                                                                                                                                                                                                                                                  directory
                                                                                                                                          directory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         position
                                                                                                                                                                                                                                                       sample
                                                                                                                                                                                                                                                                                                                                                                                 sample
                                                                                                                         sample
                                                                                                                                                                          rhythm
                                                                                                                                                                                                                                                                                                     rhythm
                                                                                                                                                                                                                                                                                                                                                                                                                                               rhythm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 offset
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sample
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             type
field
```

= < /path/to/location >

= < string >

= < real >

= < real > = < real >

< ( real, real, >

transverse-truncation

lattice-constants

int, int, int ) >

= < real > = < real >

= < int >

F - 0 ×

= < true | false >

| Ey | Ez | | By | Bz | | Ay | Az |

= < in-plane | all-domain >

= < xy | yz | xz > = < true | false >

= < ( real, real, real ) >

= < Ex | Ey | Ez | Bx | By | Bz | Ax | Ay | Az |

= < /path/to/location >

= < string >

= < real >

^ 0

= < ( real, real, real ) >

= < int >

real,

= < ( real, = < ( real,

real ) real)

= < /path/to/location >

= < string >

= < real >

ы -

Bx | By | Bz | Ax | Ay | Az | Jx | Jy | Jz |

```
= < /path/to/location >
                                                                                                                                                                                                                                               = < /path/to/location >
                                                                                                                                                                                                                                                                                                                                                                                                                = < /path/to/location >
                                                                                                                                                                                                                                = < false | true >
                                                                                                                                                                                                                                                                                                                                                                                                 = < false | true >
                                                                                                                               = < real >
                                                                                                                    = < real >
                                                                                                                                                  = < int >
                                                                                                                                                                                                                                                                                                                                                                                                                               = < string >
                                                                                                                                                                                                                                                                = < string >
                 = < string >
                                                                                                                                                                                                                                                                                              = < real >
                                  = < real >
                                                 = < real >
                                                                = < real >
                                                                                                  = < real >
                                                                                                                                                                                                                                                                               = < real >
                                                                                                                                                                                                                                                                                                                = < real >
                                                                                   = < int >
                                                                                                                  minimum-normalized-frequency
                                                                                                                                   maximum-normalized-frequency
                                                                                                                                                 number-of-frequency-points
                                                                                                                                                                                                                                                                                                                                                             bunch-profile-lab-frame
                                                                                                  normalized-frequency
                                                                                                                                                                                                                                                                                                  normalized-frequency
                                                                                                                                                                                                 power-visualization
                                                                                    number-of-points
                                                                                                                                                                                                                                                                                  plane-position
                                   plane-position
                                                   line-begin
                  base-name
 directory
                                                                                                                                                                                                                                                  directory
                                                                                                                                                                                                                                                                  base-name
                                                                                                                                                                                                                                                                                                                                                                                                                                  base-name
                                                                                                                                                                                                                                                                                                                                                                                                                  directory
                                                                  line-end
                                                                                                                                                                                                                                                                                                                                                                                                                                               position
                                                                                                                                                                                                                                                                                                                                                                                                 sample
                                                                                                                                                                                                                                  sample
                                                                                                                                                                                                                                                                                                                  rhythm
                                                                                                                               = < ( real, real, real ) > 
= < ( real, real, real ) > 
= < ( real, real, real ) >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                = < at-point | over-line >
                                                                                                  confined-plane-wave |
                                                                                                                                                                                                                 = < neumann | gaussian |
                                                                                                                                                                                                                               secant-hyperbolic |
                                                                                                                    gaussian-beam >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 = < false | true >
                                                                                   = < plane-wave |
                                                                                                                                                                                                                                                 flat-top >
                                                                                                                                                                                  = < real >
                                                                                                                                                                                              = < real >
                                                                                                                                                                                                                                                                  = < real >
                                                                                                                                                                                                                                                                                  = < real >
                                                                                                                                                                                                                                                                                                 = < real >
                                                                                                                                                                                                                                                                                                                 = < real >
                                                                                                                                                                                                                                                                                                                               = < real >
                                                                                                                                                                                                 radius-perpendicular
                                                  electromagnetic-wave
                                                                                                                                                                                                                                                                  strength-parameter
                                                                                                                                                                                radius-parallel
                                                                                                                                                                                                                                                                                                                                                                                                                                radiation-power
                                                                                                                                                                  polarization
                                                                                                                                                                                                                                                                                                  pulse-length
                                                                                                                                                                                                                  signal-type
                  EXTERNAL-FIELD
                                                                                                                                                                                                                                                                                                                 wavelength
                                                                                                                                                 direction
                                                                                   beam-type
                                                                                                                                   position
                                                                                                                                                                                                                                                                                                                                                                                                                                                            sample
                                                                                                                                                                                                                                                                                offset
                                                                                                                                                                                                                                                                                                                                                                                                 FEL-OUTPUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                type
                                                                                                                                                                                                                                < ( real, real, real ) >
                                                                                                                                                                                                                                                  = < ( real, real, real ) >
                                                                                                                                                                                                                                                                 = < ( real, real, real ) >
                                                                                                                                                                                                   confined-plane-wave |
                                                                                                                                                                                                                                                                                                                  = < neumann | gaussian |
                                                                                                                                                                                                                                                                                                                                  secant-hyperbolic |
                                                                                                                                                                                                                    qaussian-beam >
                                                                                                                                                                                   = < plane-wave |
                                                                                                                                                                                                                                                                                                                                                 flat-top >
                                  = < real >
                                              = < real >
                                                                                             = < real >
                                                                                                                                                                                                                                                                                  = < real >
                                                                                                                                                                                                                                                                                                 = < real >
                                                                                                                                                                                                                                                                                                                                                                                = < real >
                                                                                                                                                                                                                                                                                                                                                                                                 = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                  = < real >
                                                                                                                                                                                                                                                                                                                                                                                                                                               = < real >
  = < real >
                                                                                  = < real >
                                                                                                                                                                                                                                                                                                                                                                 = < real >
                                                                  = < int >
                  = < int >
                                                                                                  distance-to-bunch-head
                                                                                                                                                                                                                                                                                                                                                                                                                                                 distance-to-bunch-head
                                                                                                                                                                                                                                                                                                 radius-perpendicular
                                  polarization-angle
                                                                                   tapering-parameter
                                                                                                                                                                                                                                                                                                                                                                 strength-parameter
                                                                                                                                                                                                                                                                                radius-parallel
                                                                                                                                                 optical-undulator
                                                                                                                                                                                                                                                                                                                                                                                               pulse-length
                                                                                                                                                                                                                                                                 polarization
                                                                                                                                                                                                                                                                                                               signal-type
                                                                                                                                                                                                                                                                                                                                                                                                                 wavelength
                                                                                                                                                                                  beam-type
                                                                                                                                                                                                                                                  direction
                                                                                                                                                                                                                                position
  period
                  length
                                                                    number
                                                     gap
```