Input and Output Formats for Maxent

1 Input

The following are the input formats for data files specified by the parameter `DATA`.

1.1 Matsubara

The input format for **fermionic Particle-Hole Symmetric data** is

$$\omega_n \ \mathrm{Im}[G(i\omega_n)] \ \sigma_n^{\mathrm{Im}},$$

for **bosonic Particle-Hole Symmetric data** is

$$\omega_n \ \mathrm{Re}[G(i\omega_n)] \ \sigma_n^{\mathrm{Re}},$$

where for a N complex valued Green's function $\mathtt{NDAT} = N$. For **NON** Particle Hole Symmetric data (bosonic or fermionic), the input format is

$$\omega_n \ \mathrm{Re}[G(i\omega_n)] \ \sigma_n^{\mathrm{Re}} \ \mathrm{Im}[G(i\omega_n)] \ \sigma_n^{\mathrm{Im}},$$

where for a N complex valued Green's function $\mathtt{NDAT} = 2N$, such that `NDAT` is always even.

1.2 Imaginary Time

For the imaginary time Green's function, the imaginary time grid τ_n must be input to the program. The default input is given by the first column in your data file, but can also be given in the parameter file through the parameters `TAU_n`. Otherwise

$$\tau_n \ G(\tau_n)\,\sigma_n.$$

1.3 Legendre

The input for Legendre basis files is simply

$$\ell \ G_\ell \ \sigma_\ell,$$

where the first column *must* be the integer corresponding to the polynomial number, put sequentially.

1.4 HDF5

To read in from HDF5 rather than a text file, set the flag `DATA_IN_HDF5` to true and set `DATA` to be the HDF5 file. For any format, the Green's function needs to be a linear vector under "/Data" with errors under "/Error" or alternatively covariance matrix under "/Covariance". An important thing to note - if the data is non-PH symmetric Matsubara data, the linear vector needs to alternate real then imaginary part. Because of this, we do not recommend using HDF5 for this input set.

2 Output

Key: $A(\omega)$ - spectral function; $d(\omega)$ - default model; G_{ME} - imaginary axis back-continued Green's function; G_d - default model back-continued; P_n- posterior probability at a given α value.

Filename	Description	(Column) format
`name.out.avspec.dat`	**Bryan's method**	$\omega\ A(\omega)\ d(\omega)$
`name.out.avspec_back.dat`	The `avspec` spectrum continued back to the imag basis	$\omega_n\, G_{ME}$
`name.out.chi2.dat`	Estimated χ^2 for each α value solution	$\alpha_n\ \chi^2\big\vert_{\alpha_n}$
`name.out.chispec.dat`	**historic Maxent**	$\omega\ A(\omega)\ d(\omega)$
`name.out.chispec_back.dat`	The `chispec` spectrum continued back to the imag basis	$\omega_n\, G_{ME}$
`name.out.fits.dat`	Crude back-continuation of functions	$n\ G_{ME}\ G_{in}\ G_d$
`name.out.maxspec.dat`	**classic Maxent**	$\omega\ A(\omega)\ d(\omega)$
`name.out.maxspec_back.dat`	The `maxspec` spectrum continued back to the imag basis	$\omega_n\, G_{ME}$
`name.out.out.h5`	All output data in the hdf5 format	—
`name.out.prob.dat`	The posterior probability P_n of each α value	$\alpha_n\ P_n$
`name.out.spex.dat`	All spectral functions produced; one for each α	$\omega\ A(\omega)$ separated by #