Working Group : Post Processing and Data Analysis

Current Tools:
1. Visualization - Visit, SimulationTools, yt
2. Simulation Tools - http://simulationtools.org/
3. PyCactus by Wolfgang Kastaun: https://bitbucket.org/DrWhat/pycactuset/src/default/

Things which people would like to have:

1. Spin weighted Spherical Harmonic decomposition (spin 1 and spin 2)
2. Interpolation of data from 3-d on to a 2-d sphere.
3. Visualizing 1-d, 2-d and 3-d output.
4. Data Analysis -
   a. Computing Strain from Psi4
   b. Creating Strain in LIGO Format and recover compressed waveform data -
      https://pycbc.org/
   c. BNS - Standalone implementation of equation of state to recompute all the hydro
      quantities from primitive variables.
   d. GRMHD diagnostics by Bernard Kelly
      https://bitbucket.org/zach_etienne/nrpy/src/master/mhd_diagnostics/ ;
        i.   ^^ Depends on interpolation of GRMHD data to spherical grids, provided
             by this ETK thorn:
             https://bitbucket.org/zach_etienne/nrpy/src/master/ETK_thorns/interp_sph
             _grid__ET_thorn/

Action Items:

1. One-stop post-processing toolkit repository is needed: Common set of scripts between
   different groups (or at least used ones which are tested between groups and against
   published results).
2. A set of common open source scripts will also help using ET for new users.
3. Require Better documentation about how to use the package, specifying the
   architecture, running environment, Python versions, etc.
4. Create a general library which can be extended by users to suit their own needs. For eg.
   Reading and visualizing any 3d quantity.
   a. Provide tools to read different files and data types
   b. Visualize 1-d, 2-d and 3-d outputs.
   c. Provide basic math tools (like interpolators, derivatives, integrators, fourier
      transforms, projecting data in spherical harmonic and spheroidal harmonics)
      which can later be used for users.

d. Provide basic data analysis tools (like computing hydro variables from the primitive variables output, calculating strain from Psi4, computing multipole moments etc.,)
5. Creating examples and tutorials for the package.