Units: Perspectives & Controversies

- Is it so difficult to deal with SI and derived units ?
  - the writing rules:
    - in astronomical publications (greek, exponent, space: m s-1=m/s versus ms-1=1kHz)
    - as ASCII strings (no exponent, μ → u, avoid space → period: m.s-1=m/s)
  - the multiple/submultiple symbols (dynamic 10±24)
- How far do we accept 'exotic' units ?

http://www.iau.org/science/publications/proceedings_rules/units/

Units: an Example

mW/m2 ⇔ mW.m-2

1. Find operator . ⇒ **mW.m-2**
2. Interpret single_Units
   - mW does not exist ⇒ magnitude_prefix + Unit
   - m-2 power -2 applied to UnitSymbol m

⇒ exactly like an arithmetic expression !

Units: demo built on BNF

- Examples using a code following these rules: http://cdsarc.u-strasbg.fr/viz-bin/Unit/w
- Extension to non-SI units (angles, times, astronomical units like Lsun, AU, pc, ...)
  - value have to be known; problem of the AU which may have to change ?
  - values which can't be related to SI (Crab)
  - extension to mag (magnitudes)
- Extension to physical constants (*c G h e* ...) ?
- Extension to sexagesimal or iso8601 time ... ?
- Extension to user-defined units ?

Can user-defined units be useful ?

In some circumstances, user-defined may be useful:

- results in some well-defined instrumental units, but these units can't be easily related to SI (e.g. wavelength dependencies)
- values depends on some value of a parameter's model (e.g. Ho ?)

... *BUT* ...

- reduces the interoperability
- requires an unambiguous way of specifying such units ?