Format for comparison of inversion results

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For the comparison of inversion results it is convenient to define a standard format. These notes provide a consolidation and extension of the drafts presented in summaries of the videocons.

The format is designed for simplicity and transparency, rather than economy, given that storage space is unlikely to be a concern. Thus it contains columns that are not used for some of the inversion techniques, filled with `-9.9999d99`. In the same spirit, the results are presented as functions of the locations (x_k, θ_k) in fractional radius and co-latitude, even if these may be on a regular grid. To avoid problems with the various binary formats, the results are given in ASCII format, with a sufficient number of digits.

The format should include a header allowing a text description of the analysis, etc., as well as summarizing the data format. This should be marked by '`#`' in the first column. Information about the dataset should be included, as well as about the inversion parameters. (Here we need to consider whether the regularization parameters may be functions of position; at present, this is assumed not to be the case.) A flag should be included to define the inversion technique.

Thus the proposed structure is:

```
# ···
# ···
# Explanatory text
# ···
# ···
<input observed data>
i_tech, n_par, n_var, n_points
par(1:n_par)
1 var(1:n_var,1)
···
k var(1:n_var,k)
···
n_points var(1:n_var,n_points)
```

Here

`<input observed data>`: file name of the dataset
`i_tech`: flag defining the inversion technique [**to be defined**]
`n_par`: number of parameters in `par`
`n_var`: number of columns in `var`
`n_points`: Number of inversion points
`par`: parameters characterizing the inversion, depending on `i_tech`
`var`: inversion results.

Proposed set of variables:

`var(1)`: $x_k^{(\mathrm{tar})}$ (target fractional radius)
`var(2)`: $\theta_k^{(\mathrm{tar})}$ (target co-latitude)

`var(3)`: Ω_k (solution at target point $(x_k^{(\mathrm{tar})}, \theta_k^{(\mathrm{tar})})$)
`var(4)`: $\sigma(\Omega_k)$ (standard deviation of Ω_k)
`var(5)`: $x_k^{(\mathrm{max})}$ (position in x of maximum of averaging kernel)
`var(6)`: $\theta_k^{(\mathrm{max})}$ (position in θ of maximum of averaging kernel)
`var(7)`: $\delta^{(\mathrm{FWHM})} x_k$ (full width at half maximum in x of averaging kernel)
`var(8)`: $\delta^{(\mathrm{FWHM})} \theta_k$ (full width at half maximum in θ of averaging kernel)
`var(9)`: $x_k^{(\mathrm{cen})}$ (position in x of centroid of averaging kernel)
`var(10)`: $\theta_k^{(\mathrm{cen})}$ (position in θ of centroid of averaging kernel)
`var(11)`: $\delta^{(\mathrm{quar})} x_k$ (width in x of averaging kernel, defined by quartiles)
`var(12)`: $\delta^{(\mathrm{quar})} \theta_k$ (width in θ of averaging kernel, defined by quartiles)

Notes:

1. The inversion parameters in `par` will have to be defined, depending on the inversion technique.

2. There may well be more variables to include in the set, also depending on the inversion technique. These should be added at the end of the list, to keep the first set of variables unchanged.

3. We need to decide whether to use Ω_k (in s^{-1}) or $\Omega_k/2\pi$ (in nHz)

4. We need to decide whether to use angular widths $\delta\theta$ in latitude or linear widths $x\delta\theta$.

5. [**It is still not clear to me how to define the quartile points of a 2D kernel**].

6. [**In general, this document probably has to include some more detailed definitions of the quantities to be presented**].