

Reduced Gaussian Grids

A gaussian grid is a latitude/longitude grid. The spacing of the latitudes is not regular (see definitions below). However, the spacing of the lines of latitude is symmetrical about the Equator. Note that there is no latitude at either Pole or at the Equator. A grid is usually referred to by its 'number' N, which is the number of lines of latitude between a Pole and the Equator.

The longitudes of the grid points are defined by giving the number of points along each line of latitude. The first point is at longitude 0 and the points are equally spaced along the line of latitude. In a regular gaussian grid, the number of longitude points along a latitude is $4 \cdot N$. In a reduced gaussian grid, the number of longitude points along a latitude is specified. Latitudes may have differing numbers of points but the grid is symmetrical about the Equator. A reduced gaussian grid may also be called a quasi-regular gaussian grid.

In the reduced grids used by ECMWF, the number of points on each latitude row is chosen so that the local east-west grid length remains approximately constant for all latitudes, with the restriction that the number should be suitable for the Fast Fourier Transform used to interpolate spectral fields to grid point fields, ie number = $2^p \cdot 3^q \cdot 5^r$.

It is possible to supply a gaussian grid definition. The latitude values defining the grid can be changed or the number of points along each latitude can be specified, or both, as long as the resulting grid definition is self-consistent. The gaussian latitudes may be given as an array of values using the option 'g_lats', and the number of points along each line of latitude may be given as an array of values using the option 'g_pts'. See [INTIN](#) or [INTOUT](#).

- N32
- N48
- N80
- N128
- N160
- N200
- N256
- N320
- N400
- N512
- N640