

# Proposed Grid Mapping for RADAR and LIDAR data in CfRadial NetCDF-CF format

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## Introduction

Radars and Lidars sample the atmosphere using a pulse of energy transmitted from an instrument along a line of sight away from the instrument, with a specified beam width (solid angle). The received signal is sampled over time, which allows for the estimation of the distance of the target from the instrument.

The raw data is stored in radial (polar) coordinates. The location in space, especially in the vertical, is dependent on the propagation of the energy through the atmosphere. Vertical gradients of the index of refraction lead to complexities in determining the height of the target.

The organization and interpretation of radial data of this type is not supported by any of the standard grid mapping types currently supported by CF.

Therefore, in order for the CfRadial radar and lidar format to be formally recognized by the CF user community, we are proposing the addition of a grid mapping specifically for radar and lidar data.

## Proposed grid mapping name

We propose the use of the name "radar\_lidar\_radial\_scan".

## Grid mapping parameters

The following example from a CfRadial file shows the proposed parameters:

```
grid_mapping:grid_mapping_name = "radar_lidar_radial_scan" ;  
grid_mapping:longitude_of_projection_origin = -104.545806884766 ;  
grid_mapping:latitude_of_projection_origin = 39.7866401672363 ;  
grid_mapping:height_of_projection_origin = 1709. ;
```

The latitude and longitude are in degrees.

The height is in meters MSL.

The height\_of\_projection\_origin parameter is analogous to the perspective\_point\_height in the vertical perspective projection.