

**Comments on the paper “Surface Radiation during the Total Solar Eclipse over Ny-Ålesund, Svalbard, on 20 March 2015” submitted to Journal Earth Syst. Sci. Data by M. Maturilli and C. Ritter for possible publication.**

The authors present in their paper, the signatures of the total solar eclipse in shortwave (total, direct and diffuse) and longwave (upward and downward) radiative fluxes measurements at 1 minute time resolution and in GPS sounding data on 20 March 2015 when the eclipse evolved during 09:10 UTC to 11:11 UTC with totality observed during 10:09:53 and 10:12:11 UTC (duration of 2 minutes 18 sec) at the high Arctic site, Ny-Ålesund (78.9° N, 11.9° E) on the archipelago of Svalbard.

On 20<sup>th</sup> March, clear sky conditions prevailed over large part of the time around the time of occurrence of the eclipse, and the diurnal cycle was characterized by regular day and night time conditions. The measurements showed consistency in variations between the parameters with the progression of the solar eclipse. For instance, the thermal cooling of the snow surface is observed with the reduction in downward solar radiation; and a decrease in upward longwave radiation noted as a consequence. Since the measurements are at one minute temporal resolution and the eclipse is of short duration, the results represent overall eclipse impact. However, since the authors claim that such radiation measurements are made for the first time in the arctic environment and the radiation data are useful for a variety of other process studies, the study made here is important and the paper is acceptable for publication. The data is very useful.

I recommend the paper for publication in the Journal of ESSD.

Minor Comments

Line no 26, page 2: Replace ‘earlier’ by ‘early’

Line no 2, page 3 and on line 6, page 4: Replace ‘surface near’ with ‘near surface’

Line nos 1-4, page 3, the sentence “In these cases, the common south-east oriented su .....and glaciers South of Ny-Ålesund, bringing cold air to the station” is not clear.