Response to referee # 3 Comments:

Barja and Antuña (Authors)

We appreciate the referee´s opinions. The main goal of improving the paper is fulfilled with his help. Our point-by-point responses to the referee's comments provided below, we also added some discussions in each section of the revised paper.

Specific comments:

1) Page 8781. Line 13. The UV spectral band is strongly affected by changes of the total ozone column (TOC). The authors must explain what climatological TOC values are used as input in the RT simulations.

Response: We agree with Referee. It was already introduced in the text. Code uses the vertical profile of O3 mass mixing ratio instead of TOC. We use the vertical profile of ozone mixing ratio from the midlatitude summer (MLS) atmosphere from McClatchey, 1972. The O3 MLS profile agrees qualitatively with results from Kley et al., 2007 for our latitude.

Kley, D., H. G. J. Smit, S. Nawrath, Z. Luo, P. Nedelec, and R. H. Johnson (2007), Tropical Atlantic convection as revealed by ozone and relative humidity measurements, J. Geophys. Res., 112, D23109, doi:10.1029/2007JD008599.

2) Page 8781. Line 28. The authors should indicate if this value of surface albedo is used as a fixed value for the different spectral bands. For instance, it is known that the surface albedo in the UV region is low (typical values between 0.02 and 0.08) compared to the surface albedo in the visible spectral range (Feister and Grewe, 1995).

Feister, U., and R. Grewer (1995), Spectral albedo measurements in the UV and Visible region over different types of surfaces, Photochem. Photobiol., 62, 736-744.

Response: We agree with Referee. It was already indicated in the text. The value of surface albedo is used as a fixed value. It is obtained from the broadband solar measurements, conducted at Camagüey Meteorological Center for more than 40 years.

3) Page 8787. Last paragraph. All these results should be included in a table, adding the percentages of the contribution of the spectral band (the near infrared, visible, and ultraviolet) in upward broadband irradiance in TOA and downward broadband irradiance in SFC.

Response: We agree with Referee. It was already introduced in the text. Also we decided to maintain this paragraph in the text.

Table 1. Average, maximum and minimum values of upward and downward irradiance at TOA and SFC, respectively. In the broadband, Near infrared, visible and Ultraviolet bands.

	Irradiance (W/m^2)						Solar Irradiance at TOA Percent
	Upward Irradiance TOA			Downward Irradiance SFC			
	Mean	Max	Min	Mean	Max	Min	
Solar Broadband	91.1	166.6	60.2	322.2	356.2	212.8	100
Near Infrared	37.5	82.7	22.8	160.1	177.2	106.2	55.2
Visible	42.6	68.6	29.1	140.3	154.8	92.8	36.4
Ultraviolet	11.4	15.2	8.23	21.3	24.1	13.7	8.4

4) Page 8788. Line 7. Please replace "In the other hand the case of: : :." with "By contrast: : :.".
Response: It was already replaced in the text.

5) Page 8788. Lines 9-11. The scattering processes in the troposphere also have a significant influence on the differences between the downward irradiance in SFC and the downward irradiance in the base height. Please comment this subject.
Response: It was already replaced in the text.

"These flux densities are higher than the downward irradiance in SFC. This fact supports the explanation of the key role played by the water vapor and other trace gases in the lower troposphere radiative transfer processes. Solar radiation in the red and near infrared regions of the spectrum is absorbed at some amount by carbon dioxide, ozone, and water present in the atmosphere in the form of vapor. Scattering takes place in the lower atmosphere caused by dust, fog, and clouds with particle sizes more than ten times the wavelength of the components of solar radiation in the same magnitude in all wavelengths of the solar spectrum. Also, atmospheric selective scattering is inversely proportional to the fourth power of the wavelength of radiation and, therefore, the most severely scattered radiation is that which falls in the ultraviolet, violet, and blue bands of the spectrum. Thus, both the absorption and scattering in the lower troposphere reduce the solar radiation that finally reaches the surface"

6) Page 8790. Lines 9-14. If Jensen et al. (1994b) reported the slope of the linear relation between SCRF and the cloud optical depth, please indicate this value in the text in order to be compared with the values shown by the authors.
Response: It was already introduced in the text. But Jensen et al., 1994 did not report the value for the slope. They report negative values of SCRF. Also plot these values in relation with cirrus optical depth. And it is visually confirmed that the relation is linear.

"The negative sign and the linear relation with the optical depth of the SCRF are reported in the literature. Jensen et al. (1994), report negative sign of SCRF in the broadband solar radiation, with values lower than -80 W m^{-2}, for optical depth below 5. The authors show a linear relation between SCRF and lower values of the optical depth. The authors made theoretical calculations with ice crystal effective radius of 15 μm, and cloud altitude between 13 km and 15 km, in the case of tropical cirrus clouds."

Jensen, E. J., Kinne, S., and Toon, O. B.: Tropical cirrus cloud radiative forcing: Sensitivity studies, Geophys. Res. Lett., 21, 2023– 2026, 1994.