Response to referee # 1Comments:

Barja and Antuña (Authors)

We are very grateful for the referee´s advice and comments, which helped us improve this paper significantly. In addition to our point-by-point responses to the referee's comments provided below, we also added some detailed discussions in each section of the revised paper.
Specifis remarks.

1) To my opinion, a description of the radiative code and its connection with the lidar measurements is too short. It would be worthy to add a few equations with a clear description how the lidar backscatter coefficient is recalculated to the total extinction coefficient and how it participates in the radiative transfer equations, how it depends on the crystal size and ice water content. Half a page or so with equations would help to a reader to better understand the work.
Response: We agree with Referee. It was already introduced in the text. These aspects were discussed partially in two previous papers.
We add a paragraph after the first one in section 2:
"Cirrus cloud extinction coefficient (α) profiles were calculated from backscattering coefficients (β) profile by the relation:

$$\alpha = \beta k$$

where k is the extinction to backscatter ratio. The most suitable value of the extinction to backscattering ratio (k), for our biased dataset, is 10 sr. A constant value of k in the altitude is used in the calculation for simplicity. So extinction coefficients profiles are 10 times backscattering coefficients profiles (Antuña and Barja, 2006)."

Fifth paragraph was modified:

"The solar radiative properties of cirrus clouds in the code calculations were represented by Fu's parameterization (Fu, 1996). Fu´s parameterization use ice crystal generalized effective size (D_{ge}) as a representation of the crystal size. This parameterization combine the extinction coefficient with D_{ge} and Ice water content (IWC) assuming that hexagonal ice crystals are randomly oriented in space, by the relation:

$$\alpha = \frac{4(3)^{1/2}}{3\rho_i} \frac{IWC}{D_{ge}}$$

where ρ_i, is the ice density. Fu, (1996) obtained a set of coefficients in 25 bands of the solar spectrum to parameterize the cirrus clouds single scattering properties (extinction coefficient, single scattering albedo and asymmetry factor). In the code, two methods could be used to obtain the drop coalbedo, referred to as thin-averaging and thick-averaging techniques. The first one defines the coalbedo as the solar weighted mean value over the band spectral interval. That method was selected because of the small geometrical depth of our cirrus clouds dataset."

Also sixth paragraph in section 2 was already re-orgnaized and added some aspect related with referee suggestion:

"To consider cirrus structure in the simulation and analyze the behavior of the solar radiative transfer inside the cirrus clouds several actions were conducted. The profiles of the COD values at the coincident altitudes of the cirrus clouds and the bins of the radiative

transfer code were calculated from the cirrus lidar extinction profiles. Resolution of the lidar measurements is smaller than resolution of the code, at the altitude of the cirrus clouds. Thus, one layer of the code includes some lidar layers. The measurements vertical resolution was adjusted to the layers used in the code by the following relation:

$$\tau_{cl} = \sum_n \alpha_n \Delta z$$

where τ_{cl} is the COD in the code layer, α_n, the extinction coefficients in the layers of lidar profile, n is the number of lidar layers included in the code layer, Δz is the geometrical depth of the lidar layer, 75 m. (Barja and Antuña, 2008). Also the profiles of the ice crystal generalized effective size (D_{ge}) for the cirrus clouds particles at code bins were calculated. For such a goal the daily mean temperature profiles from the reanalysis data (NCEP, 2005) were calculated from the temperature profiles of the two most near grid points south and north of the lidar location. (Barja and Antuña, 2008)."

2) Some symbols in figures and their legends seem to be too small. I would advise to increase and to check if they are readable on the pages of the journal format.
Response: It was already revised.

3) If the authors plotted the statistical dependencies of the radiative heating and forcing on cirrus optical depth, could they suggest at least a simple and crude, but an analytical parameterizations? This seems to be possible based on these figures (perhaps not in this but in a subsequent work).
Response: We agree with referee. But we think that it will be better in a subsequent work.

4) It seems, the English in the paper may need some checking and polishing.
Response: It was already revised.