Point by Point Response to CC1

The reviews of our manuscript are thorough and well-considered. We would like to thank the reviewer for his/her careful reading and valuable comments to help us to improve this article. All the suggestions and comments from community comment 1 are addressed below point by point in bold text, followed by our responses in non-bold text. The corresponding revisions to the manuscript are marked in red. All updates to the original submission are tracked in the revised manuscript.

As the first hyperspectral infrared sounder onboard geostationary platform, GIIRS's measurements will be significantly benefit to the local NWP prediction as well as temperature and humidity profile retrievals, which are mainly guaranteed by its high quality spectrum, particularly some nonlinearity correction (NL) processing upon its observations with enough accuracy. To overcome the shortcomings of the traditional NL one, a new approach dealing with the NL correction of GIIRS is proposed where both the NL parameter μ and an iterative algorithm are established with a better performance. In my opinion, such a paper can be accepted for publication before several minor issues are clarified.

Comment 01: The NL parameter μ is originally proposed and applied in microwave sensors. Please supply some more detailed explanations about its feasibility for infrared ones (i.e. GIIRS).

Response 01: This comment is quite constructive and has been adopted by the authors. In fact, the basic mathematic expression of NL characteristics of a microwave sensor is fully identical with that of an infrared one (i.e. GIIRS), where calculations of both the linear and the NL coefficients are mainly based on the mathematical form of radiometric calibration in radiance or BT with DNs measured by a sensor. Thus, the NL parameter μ in microwave sensors can be referenced for application in an infrared one. Moreover, the NL coefficients in infrared sensors are actually inconstant while the NL parameter μ representing the relationship between the linear and NL coefficients is generally invariable, which is more suitable for description of the NL characteristics of an infrared sensor.

The supplements have been modified in the original manuscript. Please refer to lines 216-222 in section 2.2.3 of the revised manuscript.

Comment 02: In section 4, three influencing factors, i.e. SRF variation under in-orbit condition, non-ideal onboard BB source and the amplification effect of NL coefficient upon linearity one in the traditional method, are briefly discussed. It is recommended to add the corresponding subtitles to make these issues more clearly for readers.

Response 02: This comment has been adopted by the authors. According to the three influencing factors, the section 4 is divided into three parts by subtitles, '4.1. SRF variation under in-orbit condition', '4.2. Non-ideal onboard BB source' and '4.3. Amplification effect of NL coefficient upon linearity one'.

The corresponding modifications have been made in section 4 of the original manuscript. Please refer to lines 481-520 in section 4 of the revised manuscript.

Comment 03: In figure 2, three labelled information in parallelograms need to be given in a more accurate manner. For example, these parallelograms may be deleted directly.

Response 03: This comment is helpful and has been adopted by the authors. Modifications have been made

in Figure 2 of the original manuscript. Please refer to lines 120-123 in section 2.2.1 of the revised manuscript.

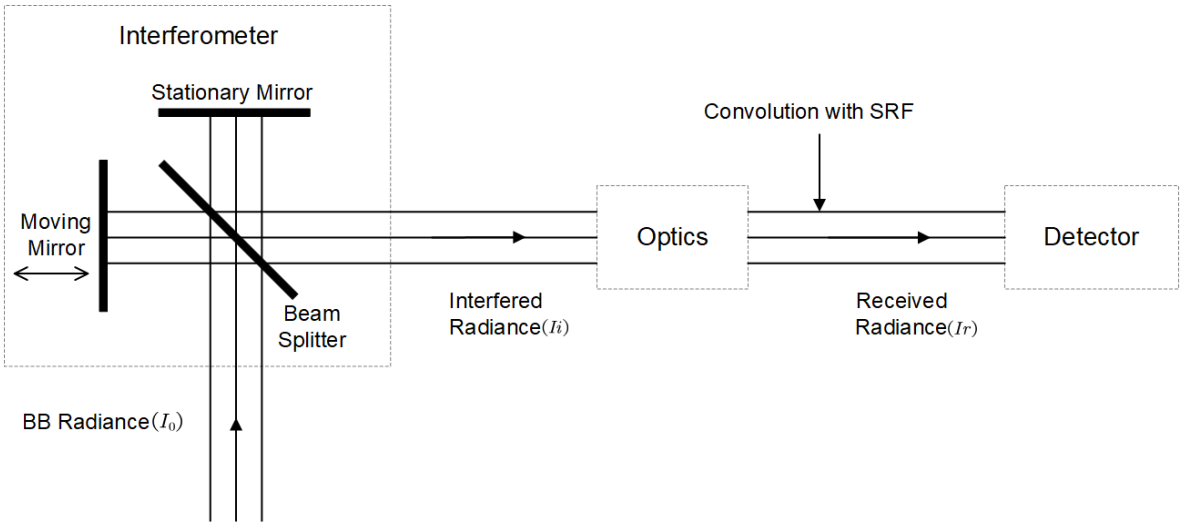

Figure 2. The simple schematic diagram of Michelson interferometer.