

Sigma Soundings Written Concept

Table of Contents

1	Overview	2
2	Weather Model Profiles.....	2
3	Combining Profiles	3
4	Configuration	3
5	Processing Data.....	3

History

Version	Date	Author	Description
0.1	March 31, 2015	Zac Zuppas, Radiometrics Corp.	Initial draft taken from Timofei's "description.pdf" document, Stick's notebook and other sources.

1 Overview

Sigma Soundings combine data from radiometers and other sources (weather models) to produce a set of data with the best of both worlds. Radiometer data provides better information in the boundary layer while model data provides better information in the upper atmosphere. The radiometer profiles are updated much more rapidly than the model data providing better time resolution in the important boundary layer. Model data contains additional information which the radiometer cannot measure, such as wind speed and direction, which helps to provide a complete picture.

The application which creates the Sigma Sounding is called the sigma-combiner. The application takes Radiometrics level 2 data and configuration settings as its input. Model data is then retrieved based on the time range of the data along with settings in the configuration as for which model to use. Some model data can be retrieved from the NOAA website:

<http://rucsoundings.noaa.gov/>

The output of the sigma-combiner application is a Radiometrics level 3 data file in the same format as the level 2 file. Other outputs are available through the configuration file.

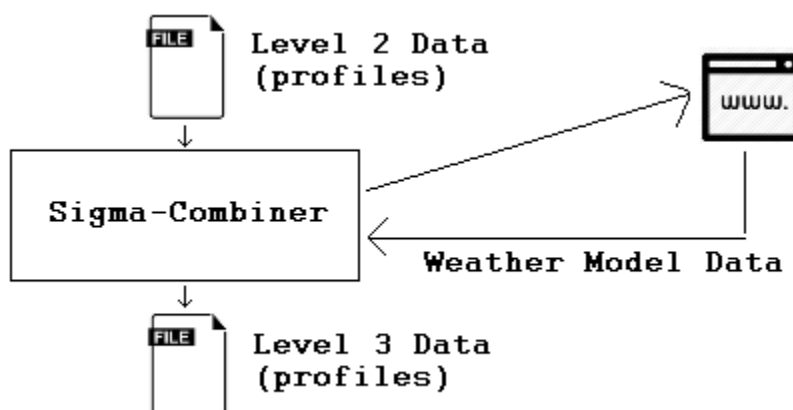


Figure 1

The level 3 data file can then be used in places where currently level 2 data is being used.

2 Weather Model Profiles

The weather model data retrieval takes as input the desired date and time and the GPS coordinates. It produces as output the atmospheric profiles for the region with some space and time resolution dependent on the model. The Op40 data source, for example, has 13-km spatial resolution, 1-hour time resolution and is updated every 18-hours.

3 Combining Profiles

Various methods of combining profiles will be explored. The initial method will be to use radiometer data only from 0-km up to a height L and model data only from the 10-km down to a height H and then blend the sources in a linear fashion between heights L and H. This is shown in the diagram below for a case where the radiometer and model data are just straight line profiles.

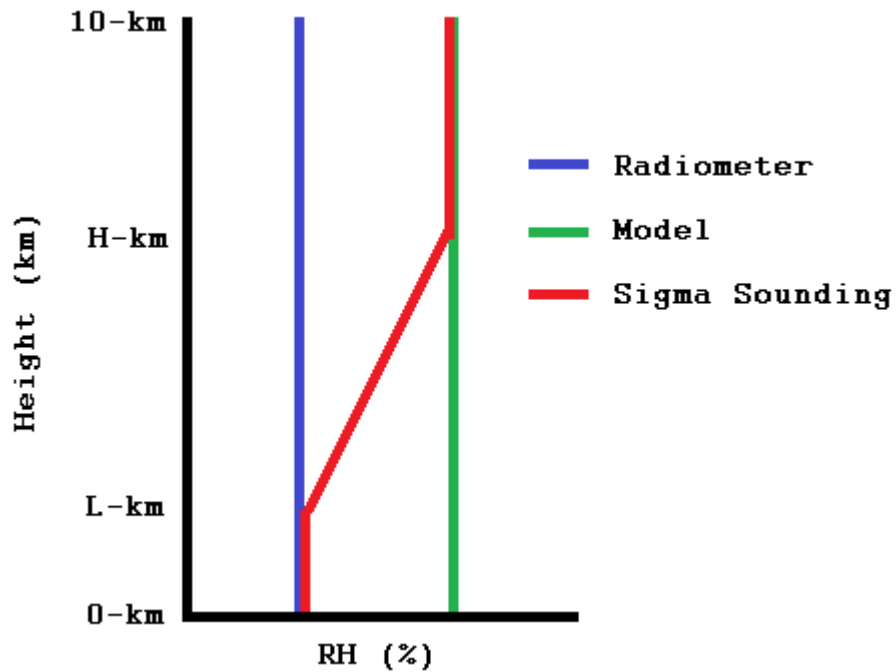


Figure 2

4 Configuration

The configuration options for producing Sigma Soundings consists of choosing (among others)

- Data file source and destination folders
- Weather models
- Output file formats
- Details on how to combine the data (linear, H and L values, etc.)

5 Processing Data

The data processing is done on a central computer. This means that the level 2 data and configuration files must be transferred from customer computers to the central computer. The sigma-combiner application runs periodically to produce the level 3 data and any other desired output files. These output files must then be transferred back to the customer.