

## **Replies to referee comments:**

The authors gratefully acknowledge the issues raised by the two referees. The detailed answers for each referee is given in the sections below in red.

### **Anonymous Referee #1**

Received and published: 19 October 2015

Paper presents conceptual design of a global hierarchical observation network consisting of three level monitoring stations: flagship, advanced/flux, and standard. The most comprehensive observation should be performed in flagship stations (globally 50) with the application of results to the global level in denser network of the advanced/flux (500) and standard (10 000) stations. The conceptual planning of the measurement stations that relies on physical conservation laws of mass, energy, and momentum and material and energy fluxes is illustrated for three examples: atmosphere, forest ecosystem, and ocean and sea ice.

The authors thank the referee for the statement.