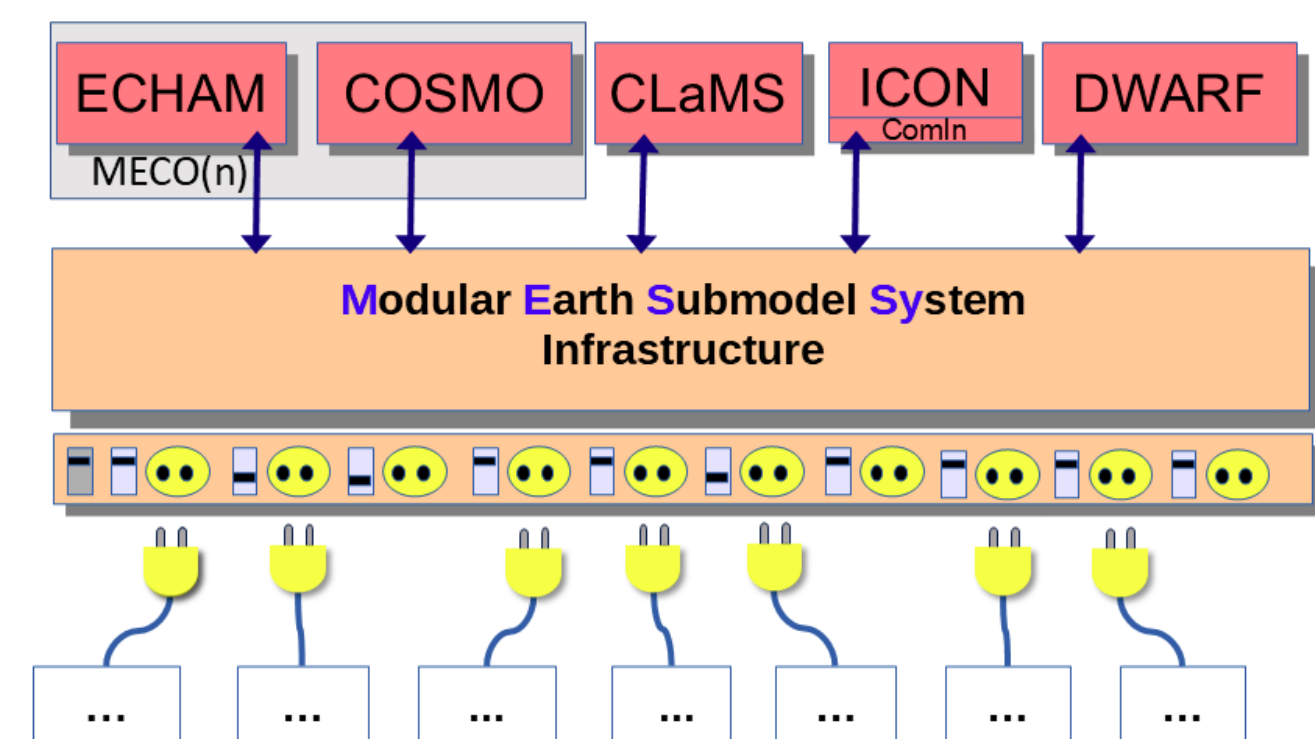


Motivation

- Unifying the multiple model frameworks within the CRC
 - towards an ICON based modelling system



- Synopsis of the individual projects in terms of a combined modelling system
 - Contributions of the individual projects beyond data delivery to a combined framework
 - Inclusion of all CRC members in a guided model development
 - Support in model developments and improvements via a team of modelling scientists guided by the Z03 team.
- Transition of the chemistry climate modelling group in Germany towards ICON/MESSy
 - Dedicated interfaces between ICON and addons
 - Improvement of existing process representations via new theoretical, semi-empirical and purely data-driven approaches
 - Consistent treatment of physics, chemistry, and aerosol processes including feedbacks from the surface to the upper stratosphere

Role within TPChange

Z03 This project is central to the whole CRC representing the important synthesis / synopsis of all projects in terms of process understanding and hence model development and model application (including scenario configurations):

Linking observations to model development, by providing benchmarks and constraining parameters

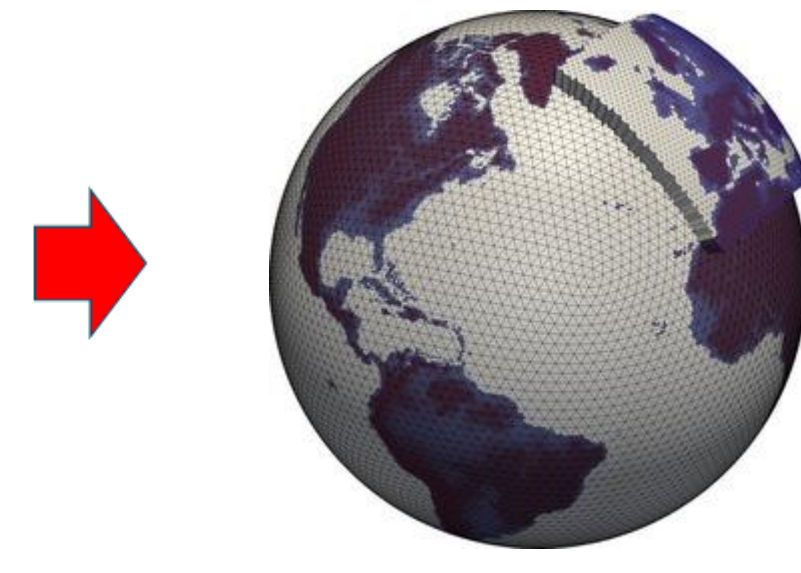
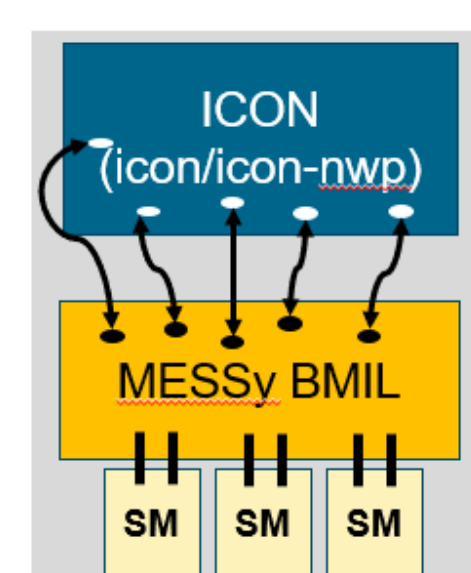
Bringing observations into larger scale context via inclusion of model results

Deriving new / improved model representations in joint efforts with contributions from data scientists, experimentalists, model developers and model applicants.

all projects

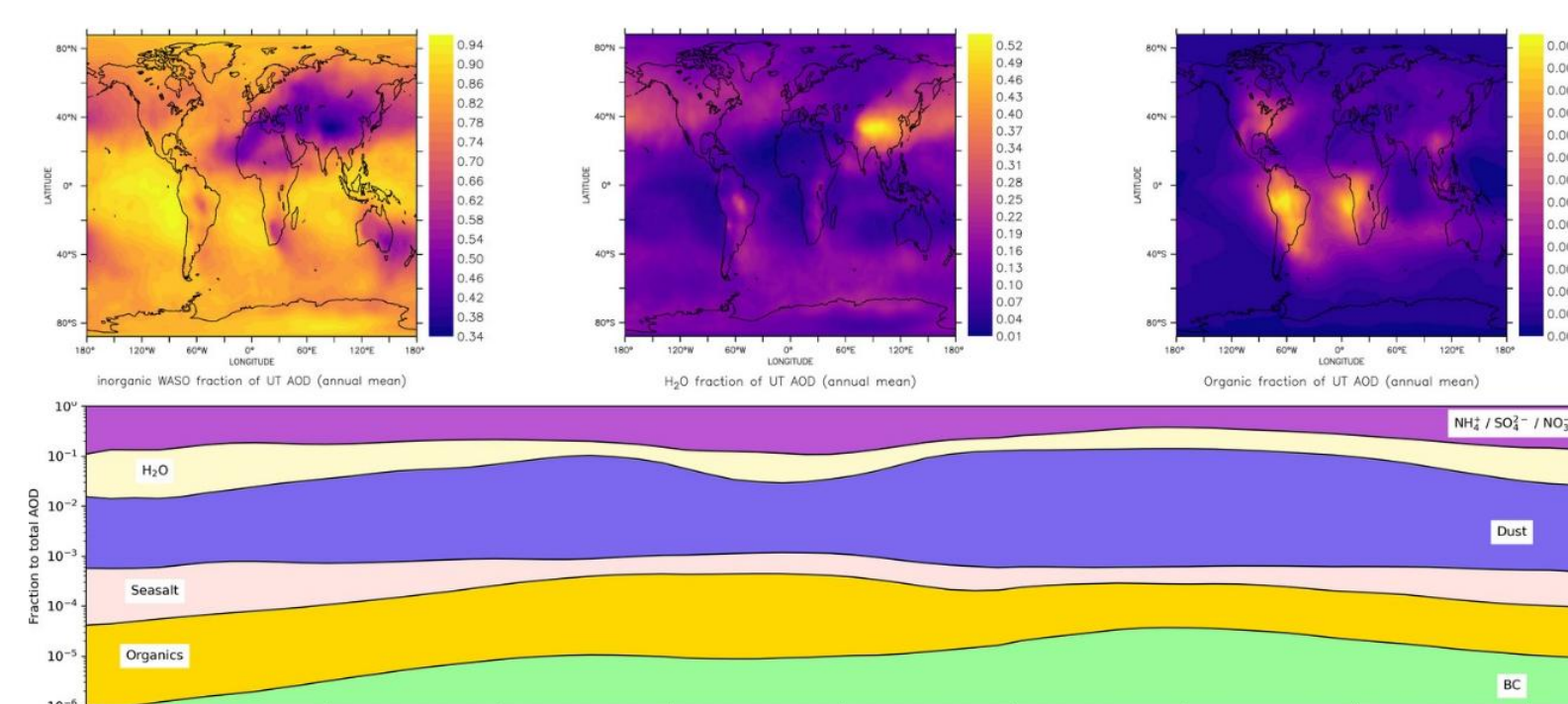
Results from phase I

- Developing an infrastructure for linking MESSy with ICON (with support from outside the CRC)



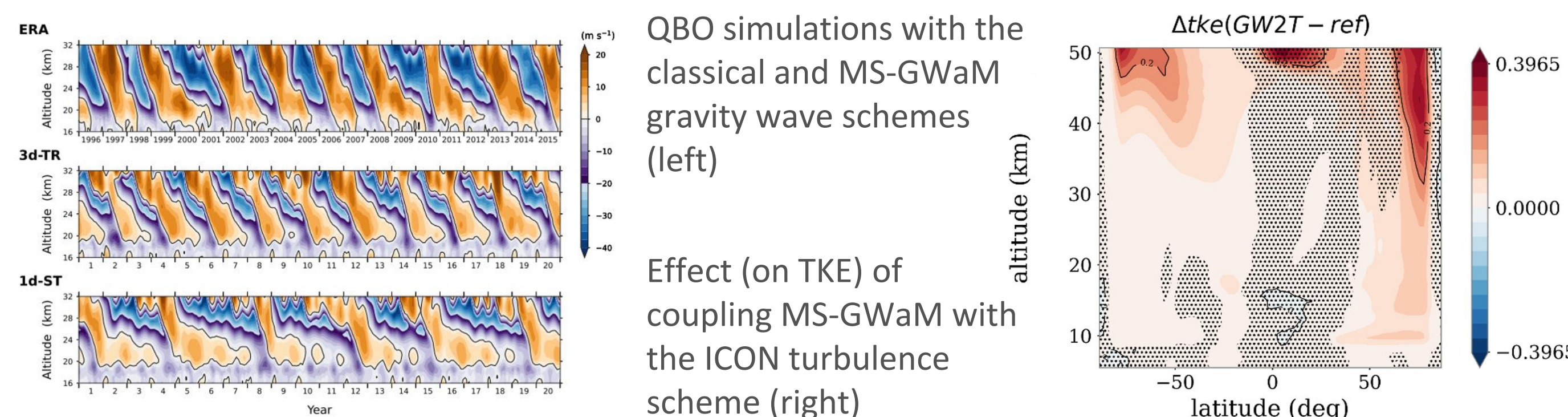
- Usage of the newly developed ComIn infrastructure to link external codes with ICON via a dedicated interface

- (Re)-formulating and (re)-coding of processes submodels to allow the coupling to ICON/MESSy, e.g., for aerosol optical properties (AOP), convective tracer transport, aerosol processes, etc.

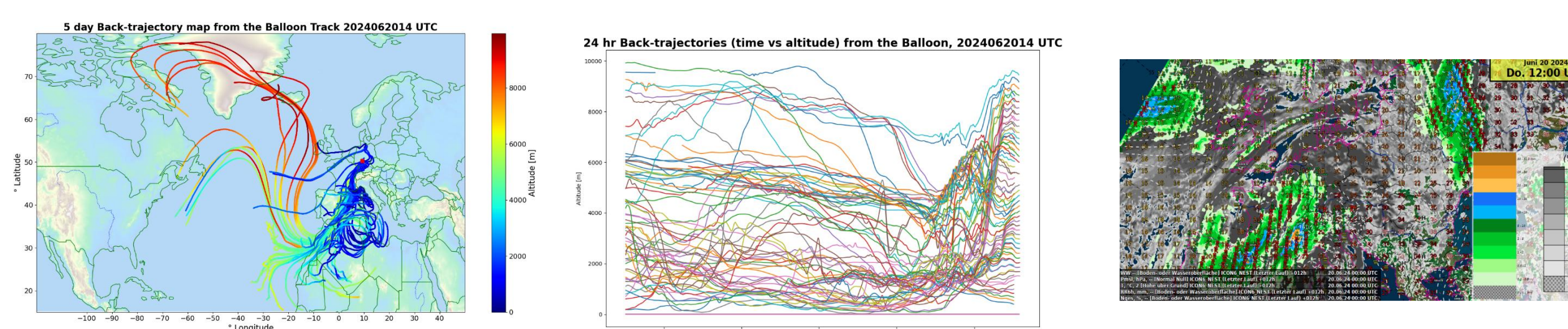


- e.g., contribution of individual aerosol components to aerosol extinction in the UTLS

- Improving the coupling of a gravity wave model within ICON



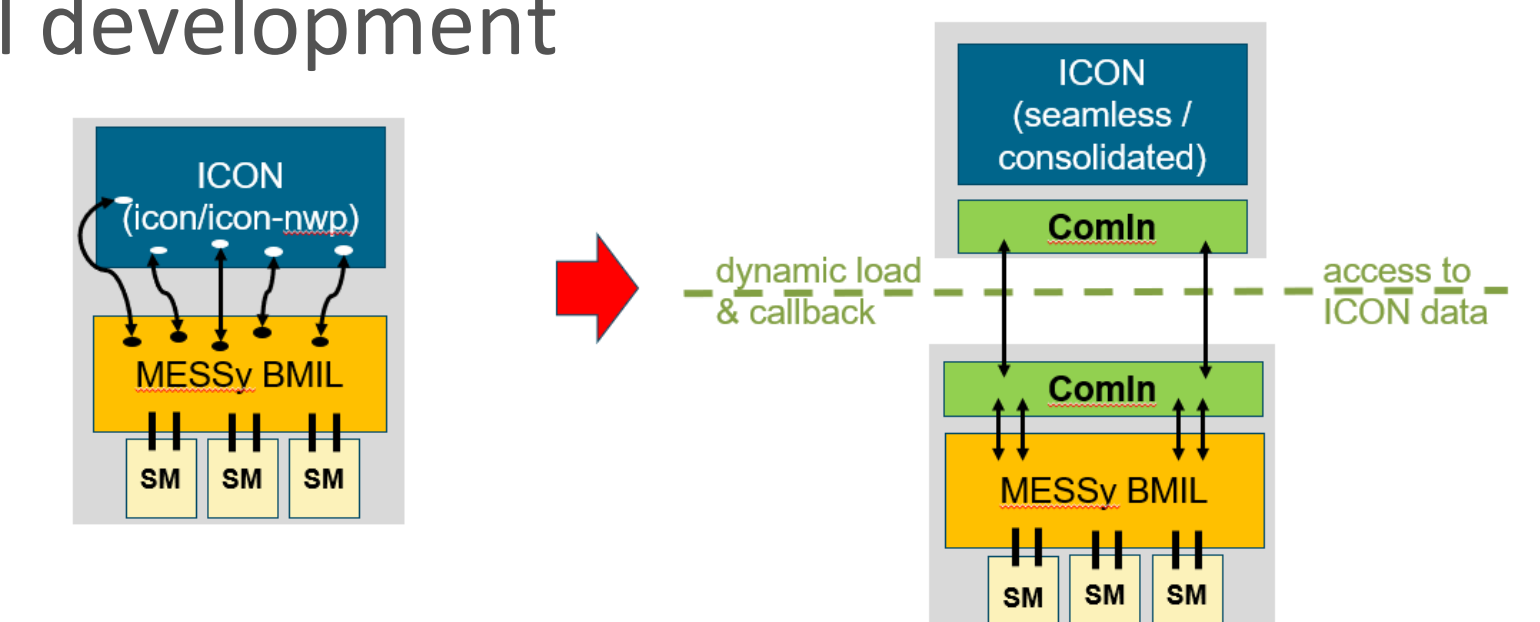
- Supporting projects in / with model applications, mostly with ICON, EMAC, and MECO(n)
- Supporting other projects with model products and forecasting, e.g., backward trajectories and weather forecasting for balloon flights (e.g., B02) → linking observations and models.



Research plan phase II

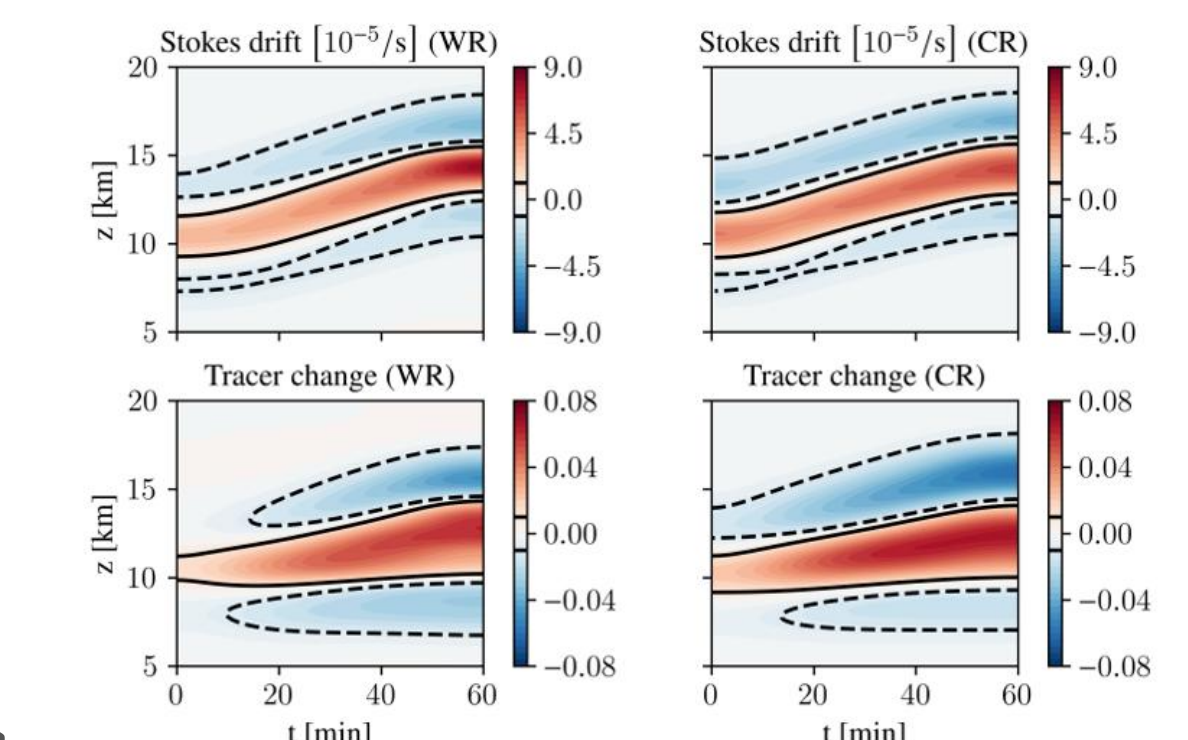
Main Goal: The central goal for phase II is further development of the ICON/MESSy system to allow for an encompassing synopsis of the results of the whole CRC.

- Usage of the ComIn structure for ICON to finalise the coupling of ICON/MESSy → model development



- Links between gravity waves, turbulence, transport and clouds → model development

Comparison between parameterised and high-resolution resolved effects of gravity wave impact on tracers



- Ongoing support for models in the CRC
- Development and establishment for workflows and schemes for modelling projects and cooperations
 - Modelling courses and tutorials for PhD candidates, PostDocs, etc.
- Ongoing development and improvement of parameterisations and process formulations required / desired for the UTLS (with all members of the CRC) leading to an overall **SYNOPSIS** for the CRC by including the findings of the whole CRC in **one consistent** modelling framework.

