The project MAGIC focuses on the handling and processing of the future GRACE-FO instrument data to allow for a continuation and improvement of the GRACE derived gravity field time series. In addition to pre-processed data products (Level-1B) as available from GRACE, raw observations (Level-1A) will be publicly available for the first time. This enables a more detailed analysis of the instrument data, which is not only essential for improving gravity field solutions, but also for preparing next generation gravity field mission. Therefore, it is necessary to meet the challenges of the new data, to incorporate new observation types into the gravity field recovery (e.g., LRI) and to enhance both Level-1A and Level-1B data processing methodologies.

In summary, a processing chain tailored to the data and the future GRACE-FO satellite is envisaged, providing a continuous and highly-accurate data record for climate research.

**Major goals**

- GRACE Level-1A and Level-1B data handling & processing capability
- Improved processing methodologies based on the use of Level-1A data products (e.g., enhanced sensor fusion approach)
- Extension of the gravity field time series
- Publication and validation of GRACE-FO derived gravity field solutions (Level-2 & user-friendly Level-3 data products)

**GRACE Follow-On (GRACE-FO)**

The GRACE-FO mission - successor to the original GRACE mission - carries on the work of its predecessor and is expected to be launched in spring 2018 [2].

Onboard GRACE-FO evolved versions of the following instruments will be used:

- KBR ranging instrument
- GPS receiver
- SuperSTAR accelerometer
- Attitude determination based on three star camera (SCA) heads

A secondary objective of GRACE-FO is to demonstrate the effectiveness of a Laser Ranging Interferometer (LRI) in improving the inter-satellite ranging accuracy [3]. Therefore, the LRI serves as a technical demonstration of the possibility that precision laser interferometry can help to improve the spatially resolved internal resolution of the derived gravity field models.

**Implementation of user-friendly Level-3 data products**

In addition to pre-processed data products (Level-1B) as available from GRACE-FO, raw observations (Level-1A) will be publicly available for the first time. This enables a more detailed analysis of the instrument data, which is not only essential for improving gravity field solutions, but also for preparing next generation gravity field mission. Therefore, it is necessary to meet the challenges of the new data, to incorporate new observation types into the gravity field recovery (e.g., LRI) and to enhance both Level-1A and Level-1B data processing methodologies.

In summary, a processing chain tailored to the data and the future GRACE-FO satellite is envisaged, providing a continuous and highly-accurate data record for climate research.

**Major goals**

- GRACE Level-1A and Level-1B data handling & processing capability
- Improved processing methodologies based on the use of Level-1A data products (e.g., enhanced sensor fusion approach)
- Extension of the gravity field time series
- Publication and validation of GRACE-FO derived gravity field solutions (Level-2 & user-friendly Level-3 data products)

**GRACE Follow-On (GRACE-FO)**

The GRACE-FO mission - successor to the original GRACE mission - carries on the work of its predecessor and is expected to be launched in spring 2018 [2].

Onboard GRACE-FO evolved versions of the following instruments will be used:

- KBR ranging instrument
- GPS receiver
- SuperSTAR accelerometer
- Attitude determination based on three star camera (SCA) heads

A secondary objective of GRACE-FO is to demonstrate the effectiveness of a Laser Ranging Interferometer (LRI) in improving the inter-satellite ranging accuracy [3]. Therefore, the LRI serves as a technical demonstration of the possibility that precision laser interferometry can help to improve the spatially resolved internal resolution of the derived gravity field models.