

<b>PROJECT: Studi di Cosmologia</b>		<b>WP REF.: 9-6X1</b>
<b>WP TITLE: Foreground modeling and removal</b> <b>SUB-CONTRACTOR: SISSA</b> <b>START EVENT: KO</b> <b>END EVENT: RF</b> <b>WP MANAGER: Francesca Perrotta</b>		<b>Sheet: 1 of 1</b>  <b>Issue Ref: 1</b> <b>Issue Date:01/09/2016</b>

## 1. OBJECTIVES

The Foreground Modeling and Removal Work Package (FMR) has the following main objectives: modelization of the diffuse Galactic foregrounds, in particular for polarization, the separation of Cosmic Microwave Background (CMB) polarization anisotropies from polarized diffuse foregrounds in the Galaxy. The main links with other WPs are: CMB@LF (MI), CMB@HF (RMI), CMB from Space (BO), Inflationary GWs and Non-Gaussianity (PD), Point Source extraction (RMII), Astroparticle and Fundamental Physics, Support to LSPE and Simulations (INAF-OATs).

## 2. INPUTS

Observed or Simulated multi-frequency CMB maps. Characterization of noise statistics, angular resolution. Characterization of non-diffuse astrophysical signals.

## 3. TASKS

- Task 1, Experimental design: support for forecasting foreground cleaning for feasibility study, T+0 - T+6M
- Task 2, Polarized Foreground modeling: 3D Modeling of Galactic diffuse polarized emission, comparison with existing data and model updating, T+0 - T+36M
- Task 3, Foreground cleaning: production and testing of foreground cleaning data analysis software finalized to polarization and B-modes, T+0 - T+36M
- Task 4, Data analysis: application of algorithms to data, T+24M - T+36M

## 4. OUTPUTS

- Deliverable 1 (from Task 1): Software for forecasting of foreground cleaning capabilities T+1M
- Deliverable 2 (from Task 1): Optimal configurations in terms of number of bands and sensitivity for feasibility studies, T+6M.
- Deliverable 3 (from Task 2): unified Galactic magnetic field model for Dust and Synchrotron, T+12M
- Deliverable 4 (from Task 2): inclusion of data from Quijote, optimization of synchrotron emission, T+24M
- Deliverable 5 (from Task 2): production of sky model for exploitation in data analysis, T+24M
- Deliverable 6 (from Task 2): CMB and diffuse foreground separation from data, T+36M



- Deliverable 7 (from Task 3): prototype software for parametric foreground fitting, T+12M
- Deliverable 8 (from Task 3): prototype software for internal linear combination, T+12M
- Deliverable 9 (from Task 3): validation, T+24M
- Deliverable 10 (from Task 4): CMB and diffuse foreground separation from data, T+36M

## 5. SCHEDULE

Tasks:

- Task 1, T+0 - T+6M
- Task 2, T+0 – T+36M
- Task 3, T+0 - T+36M
- Task 4, T+24M – T+36M

Deliverables:

- Deliverable 1: T+1M
- Deliverable 2: T+6M.
- Deliverable 3: T+12M
- Deliverable 4: T+24M
- Deliverable 5: T+24M
- Deliverable 6: T+36M
- Deliverable 7: T+12M
- Deliverable 8: T+12M
- Deliverable 9: T+24M
- Deliverable 10: T+36M

