MEGHA-TROPIQUES

A CO-OPERATION PROGRAMME BETWEEN

Centre National d 'Etudes Spatial, France

Indian Space Research Organisation, India

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MEGHA*-TROPIQUES

DEFINITION AND OBJECTIVES

- Megha-Tropiques, a joint satellite based mission devoted to
  - the study of atmospheric water cycle and associated convective systems in the inter-tropical zone
  - a better understanding of the tropical climatology
  - the eventual improvement of moonsoon forecasting models
- Launch date target: mid of 2006 from Sri Harikota (SHAR)

**from the Sanscrit word for « clouds »*

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HISTORICAL STEPS

- 1998: joint decision by CNES & ISRO leading to a one year duration pre-feasibility study
- Statement of Intent signed end of 1999:
  - co-operation agreement with no exchange of funds
  - definition of the sharing of the agencies contributions
- 2000-2001: detailed feasibility studies leading to the freezing of the satellite baseline configuration
- MOU for definition studies signed in May 2001

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THREE INSTRUMENT PAYLOAD DEFINITION

- MADRAS (Microwave Analysis & Detection of Rains & Atmospheric Structure):
  - multifrequency passive scanning radiometer (18.7-157 GHz)
  - imaging water vapour, rains and ice distribution
- SCARAB (SCanner for RAdiative Budget):
  - measure of radiative fluxes from Earth in the IR domain
- SAPHIR *(Sondeur Atmosphérique du Profil d'Humidité Intertropicale par Radiométrie)*:
  - water vapour profiler from 0 to 12 km altitude (around 183 GHz)

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SHARING OF RESPONSIBILITIES

CNES	ISRO
- RF part of MADRAS	- MADRAS prime cont.
- SCARAB equipment	- Scanning mechanism
- SAPHIR equipment	- MADRAS AIT
- Satellite platform	- Whole payload AIT
- Satellite AIT	- Data mission center
- Control center	- PSLV launch

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FRENCH INDUSTRIAL DEVELOPMENTS

- MAdras Radio-Frequency EQuipment (MARFEQ) developed by Astrium Cy. (EADS group)
- SCARAB instrument developed by *Laboratoire de Météorologie Dynamique* (LMD)
- SAPHIR instrument developed by LMD + other labs.
- platform derived from the PROTEUS series developed by Alcatel Space Ind.

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DATA SAMPLING & ORBIT DEFINITION

- 867 km altitude orbit with 20° inclination for up to 6 revisits a day at any location of the intertropical zone
- chosen altitude compatible with the relatively low resolution required:
  - 40 km MADRAS pixel size for 18.7-36.5 GHz range
  - 10 km MADRAS pixel size at 89 GHz
  - 6 km MADRAS pixel size at 157 GHz
- quasi real time reception of data acquired over India