

# THE USE OF AN ENVIRONMENTAL HELICOPTER FOR THE MONITORING OF AGRO-ECOSYSTEMS



Mikrowellen-radiometer

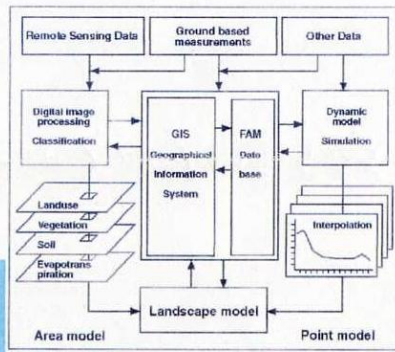
Wärmebildgerät

Abb. opt. Spektrometer

Main topic of the research network **FAM** is to evaluate landuse changes in agroecosystems. The following steps are planned:

1. Quantification of changes of the state and function of the agricultural ecosystems.
2. Prognosis, risk analysis and evaluation of the changes of state function of the agricultural ecosystems.
3. Development of strategies to avoid negative impacts in agroecosystems and neighbouring ecosystems by landuse and to restore existing damages.
4. Transfer of strategies of sustainable agriculture to agriculture practise.

As the basis to model feeding and modvalidation, remote sensing is a sensible and effective device. For achieving high resolution signature registration the **Environmental Helicopter "EcoCopter"** has proved to be an appropriate sensor platform.



- **Primary parameter**
  - spectral radiance
  - surface temperature
  - surface roughness
  - photos and video images
  - different gas concentrations

- **Advantage of the Helicopter**
  - optimal flight altitude for overall area resolution
  - capability to hover
  - time flexibility in measurement
  - high maneuverability
  - surface sampling
  - fills gap between satellites and ground stations
  - Satellites sensor calibration on Helicopter

- **Advantage of remote sensing**
  - optimal flight altitude for different area resolutions
  - large area measurement
  - area averaged measurement
  - contactless data collection

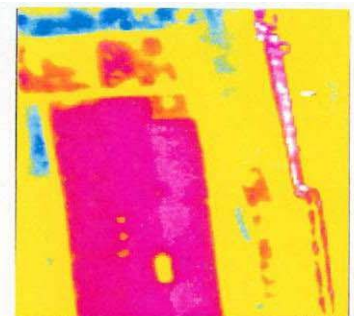
- **Secondary parameter**
  - crop type
  - vitality
  - biomass
  - soil moisture
  - evapotranspiration



Klostergut Scheyern  
Aerial picture



Klostergut Scheyern  
FAM map



Klostergut Scheyern  
Thermal image

Acknowledgement: The scientific activities of the research network **"Forschungsverbund Agrarökosysteme München" (FAM)** are financially supported by the **Federal Ministry of Research and Technology (BMFT 033970)**. Rent and operating expenses of the farm in Scheyern are paid by the **Bavarian State Ministry for Education and Culture, Science and Art**.

Presented at: European "International Space Year" (ISY) Conference 1992  
Space in the Service of the Canging Earth  
Munich, Germany  
30. March - 4. April 1992

Herrn Scheurer (GSF)

Dr. Hantschel (FAM)

H.S. Haisch, Dr. H.-D. V. Böhm (ECD)