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Impact Risk Analysis

Damage Assessment

Mission Safety

Please feel free to contact us for further informations.

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Space Debris and Meteoroids · a vital Risk to Space Missions

More than 300 satellite fragmentations in space resulting in about 700.000 objects > 1 cm and hundreds of millions objects > 1 mm have polluted the space environment. Satellite missions are facing a threatening risk of being severely damaged by such particles.

The need of assessing the probability of damage from space debris and meteoroids is well recognised within the community of satellite designers and operators. Moreover, impact risk assessments are today a mandatory task within most satellite projects governed by institutional agencies such as ESA.

Tools and Models · the proper Approach for Impact Risk Assessment

Models describe the particulate environment of the Earth as well as the damage potentially caused by impacts. Sophisticated tools like ESABASE2 connect these models with user defined mission planning aspects such as satellite geometry and materials, the mission orbit and manoeuvres.

The proper application of these models and tools is an expert task requiring a sound technical and theoretical background, experience in the application of tools and especially the knowledge and ability to interpret and explain the results provided. This know-how is not always available at the satellite designers.

etamax space · Decades of Experience in Impact Risk Assessment and Mission Safety

etamax space provides impact risk assessment as a consultancy service. Under application of ESABASE2, ESA's standard risk assessment tool developed by etamax space, we are supporting the European Space Industry with the required expertise.

Our heritage spans over decades and includes

- participation in the development of ESA's MASTER (Meteoroid and Space Debris Terrestrial Environment Reference) model,
- participation in the development of ESA's Space Debris Mitigation Handbook,
- development of ESABASE2 - ESA's standard risk assessment tool,
- many risk assessment consultancies for European Space Industry.

The services provided by etamax space comprise a complete data and documentation file suitable to satisfy damage probability analysis requirements of e.g. ESA.

Our services include

- establishment of the satellite geometrical model,
- establishment and justification of the mission damage susceptibility approach,
- selection and justification of the environment models and failure equations,
- 3D M/OD analyses by means of the ESABASE2/Debris software,
- discussion of results vs. requirements and provision of design improvement ideas,
- documentation and detailed discussion of the analysis results.

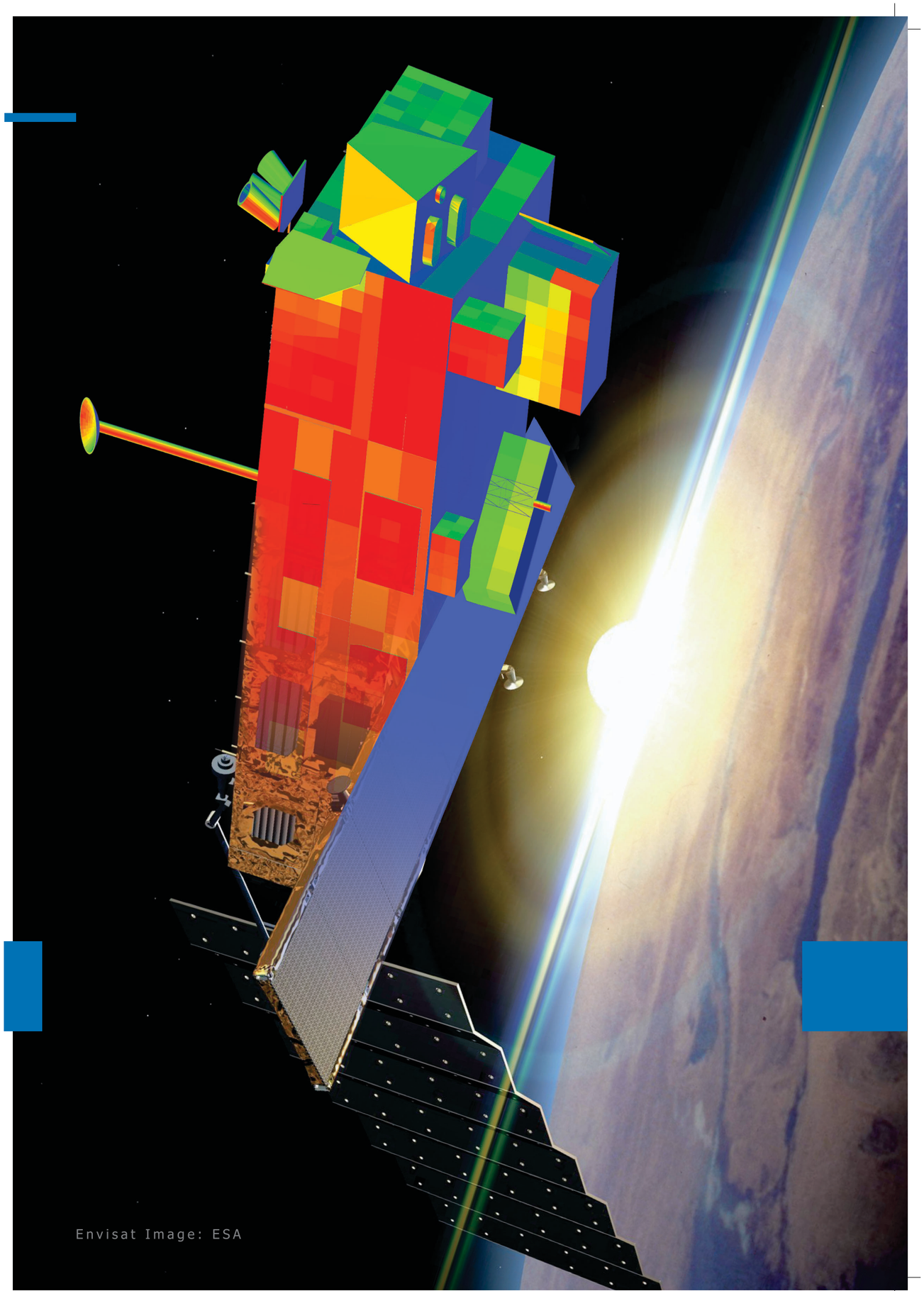
Mission safety · Services provided by etamax space

In addition, the following services can be provided by etamax space to support the safety of your mission:

- space environment analyses (e.g. atomic oxygen)
- collision risk assessment and avoidance manoeuvre planning
- re-entry safety analysis

The results provided by etamax space

- enhance the mission safety,
- address the requirements posed by the respective standards (e.g. ISO 24113 and sub-sequent standards; European Code of Conduct for Space Debris Mitigation, etc.),
- support the establishment of the Space Debris Mitigation Documentation and
- are qualified to support the acceptance process at ESA.



Envisat Image: ESA