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SYMPOSIUM ON NEW TECHNOLOGIES FOR FUTURE SPACE ASTRONOMY MISSIONS (A7)
Lessons Learned (5)

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A CHALLENGE FOR INDUSTRY: SPACE SCIENCE PAYLOADS EXAMPLE: THE XXM NEWTON MISSION

Abstract

State-of-the art scientific demands for future space science missions usually mean for industry to apply cutting edge technologies for the first time in space or to use technologies under extreme boundary conditions. Furthermore there are continuous changes in the objectives of the different science missions. In addition, after the successful realisation of a certain type of science missions there is a cycle of typical 10-15 years until another science instrument of a similar wavelength region will again be selected for a future mission. Industry efforts are required to keep track of the evolving technology over time.

Kayser-Threde is now over 40 years in the space business with a long history in successful realisation of multiple optical payloads and telescopes for space science on national and ESA level (e.g. PACS, XMM-NEWTON, SOFIA, ORFEUS, SUNRISE,...). In this context the XMM-Newton (X-Ray Mirror Mission) telescope is a good example for the technical challenges to industry, ways to proceed and lessons learned for future x-ray space telescopes. As the second cornerstone mission within the ESA Horizon 2000 science programme, the XMM imaging Wolter-I telescope requirements were at the definition time beyond existing manufacturing capabilities. The competences of a space company (Kayser-Threde) and non space company (Media Lario) have been combined to solve the technical challenges. Media Lario provided the competence in galvanic industrial production, applied to gold coated nickel mirrors in space. Kayser-Threde provided the space knowledge and the experience in opto-mechanical system engineering. This combination was the success factor in realising an exceptional space telescope. XMM-Newton operates in orbit for over 10 years still delivering outstanding data sets for x-ray astronomers. But follow-on applications of the specialised technology developed for XMM by Media Lario are limited up to day.

In the paper, a general description of the industrial challenges in developing complex space based science payloads, fulfilling demanding x-ray astronomy requirements and putting in place specific industrial methods to realise such payloads will be described. Furthermore lessons learned are highlighted and an outlook into the future of ESA's x-ray space mission IXO is given.