



Cool electronics check temperatures in deep space

The SEA designed and built 4K Cooler Drive Electronics (4KCDE) is due for launch today on an Ariane 5 rocket. The 4KCDE is a critical part of the High Frequency Instrument (HFI) on the Planck spacecraft. The 4KCDE is one of several UK contributions to the Planck scientific payload funded by STFC in the UK.

Planck is a European Space Agency mission to map the Cosmic Microwave Background. The Planck spacecraft will orbit the Sun approximately 1.5 million kilometres from the Earth. The HFI will look for fast variations in the background temperature of deep space. The temperature of the detectors used in the instrument needs to be extremely cold (approximately 0.1°C above absolute zero). The 4KCDE is used to control and drive mechanical coolers which cool these detectors.

This is an important milestone for SEA. The 4KCDE is the first flight hardware which has been designed and built by the company and which will be launched into space. The 4KCDE project started in 2001 and today's launch represents the culmination of several years of work. This project has allowed SEA to exploit its specific expertise on processor systems including the onboard software. The SEA designed electronics allows the precise control of the motions of the compressors so minimise the mechanical disturbance to the sensitive instrumentation on the satellite whilst achieving the required cooling that is needed. The large distances between the spacecraft and the Earth also place great emphasis on the robustness of the designs.

The Planck 4K cooling system also involves the Rutherford Appleton Laboratory whose Cryogenic Systems Group are responsible for the 4K cooling system as well as the Space Instrumentation Group who have been responsible for certain aspects of the design of the 4KCDE.