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Introduction: Building on the experience from previous ESA planetary missions, and with a strong commitment to releasing high-quality calibrated data in a timely manner, BepiColombo has adopted an ambitious and innovative data processing strategy.

The specific characteristics of the BepiColombo mission (a long cruise phase and therefore long mission duration) make the software maintenance and technology evolution into risk factors that deserve thorough consideration.

The selected solution aims to avoid software performance degradation due to changes in the technology over a long time-span. This is particularly critical for the BepiColombo data processing software, as its development is the result of a joint effort between many different actors (Science Operations Centre and Instrument Teams) subject to significant human resource changes that could impact the software maintenance over the years.

Details: This contribution will summarise the main drivers and key features of the science data processing infrastructure for BepiColombo, and will describe its implementation, with a focus on the following aspects:

- The use of state-of-the-art virtualisation technology for automatic build, deployment and execution of the pipelines as independent application containers. This allows specific software environments, and underlying hardware resources, to be isolated, scaled and accessed in a homogeneous fashion. This provides an added value and cost-effective solution, which reduces the maintenance of a heterogeneous set of software applications as technology evolves. The orchestration, scheduling and distribution capabilities for such virtual containers will be natively provided by the virtualisation technology's platform and ecosystem. Thus, instrument-specific contributions can be delivered in the form of ready-to-use code to be deployed in a specific container or as container instances directly.
- A set of core libraries / tools (e.g. telemetry decoding, PDS product generation and validation, conversion to engineering units, Java to SPICE binding, routines for typical geometry computations) reused for certain processing steps in different pipelines.

Following a successful launch in October 2018, the data processing infrastructure is now in use for a subset of the scientific instruments. During the 7.5 years of cruise, there will be several opportunities to test and demonstrate its capabilities and to adapt the implementation as required to best fit the mission needs. With a nominal mission-lifetime of 1 year, this strategy is key to guarantee and maximise the scientific results.

The implementation follows a quite generic and modular architecture providing a high level of flexibility and adaptability, which will allow its re-usability by future ESA planetary missions (e.g. JUICE).