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ATLAS Software and Computing for the Future

To achieve its physics program, the ATLAS collaboration operates large, internationally- distributed computing systems and maintains millions of lines of code. These systems and software are growing in complexity in preparation for the High Luminosity upgrade of the LHC. The planned development of the experiment software has been shaped by the integration, validation, and adoption of new hardware for computing, deployment of work on High-Performance Computing systems and commercial clouds, stringent demands on physics precision, and drive for common solutions. As input to the European Particle Physics Strategy Update, the opportunities and challenges in ATLAS software and computing impact the future direction of the field in the following ways:
• The challenges that ATLAS takes on overlap significantly with the challenges that face future colliders, and the solutions that have been, are being, and will be developed form an excellent starting point for any future collider.
• Investment in the people supporting the existing software and infrastructure while working to solve these challenges in the coming years is therefore not just critical for the experiment, but for the future of the field as a whole.

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