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AMPEL: Scientific exploration in the era of high throughput astronomical observatories

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The rapid development of detector technology, including these sensitive to gravitational waves and neutrinos, has brought us to the gate of an era where we will be able to observe transient events as they unfold throughout a large fraction of the Universe. The availability of these data floods requires new systems for data processing and the consistent application of modern statistical methods.

I will here introduce AMPEL, an open source development platform for real-time data analysis. Users develop and tune complex workflows in a local development environment which can be uploaded to a computer center for large-scale live processing or shared for reproducibility, effectively introducing the “code-to-data” paradigm in astronomy.

AMPEL is already a critical component of current era real-time multi-programs and will be one of the brokers for the LSST real-time alert stream. Results from the ELAsTiCC simulations show that the technology and photometric classification methods are now mature for these data rates.

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