

P9 Key applications of the Weather Research and Forecasting (WRF) model running on GPUs, AceCAST.

Elliot, Samuel, S. M. Iman Gohari, Daniel Abdi, Donald Birchhoff, and Gene Pache,
TempoQuest Inc.

The Weather Research and Forecasting (WRF) model is an open source, mesoscale numerical weather prediction system designed to serve both operational forecasting and atmospheric research needs. TempoQuest (TQI) is translating WRF to run on NVIDIA graphic processor units (GPUs.) The target acceleration goal is 10 times speed up compared against the latest generation central processor units (CPUs) on high performance computing clusters with ultrafast interconnections. TQI has achieved 5 to 7 times acceleration.

The TQI GPU computed WRF software is called AceCAST. TQI will initially offer AceCAST tuned for five general application areas in early 2019. The application areas include agriculture, renewable energy, wildfires, ground transportation and public weather. TQI has transformed several physics modules and the dynamic core. TQI will add application areas and physics module choices based on market demand. TQI will offer AceCAST to run on client premise, Platform-as-a-Service (PaaS) or Software-as-a-Service (SaaS.) The SaaS offering is available via a scalable, cloud-based weather production and visualization system comprised of various sub-components. TQI will deliver outputs via TQI visualization software or web services including machine to machine API transfers. This paper will inform WRF users about AceCAST applications, the scalable platform architecture and product features.