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S.Pamela & J.Buchanan

VVUQ app

Slides for Andy Davis

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Energy

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Ada Lovelace Centre Funding

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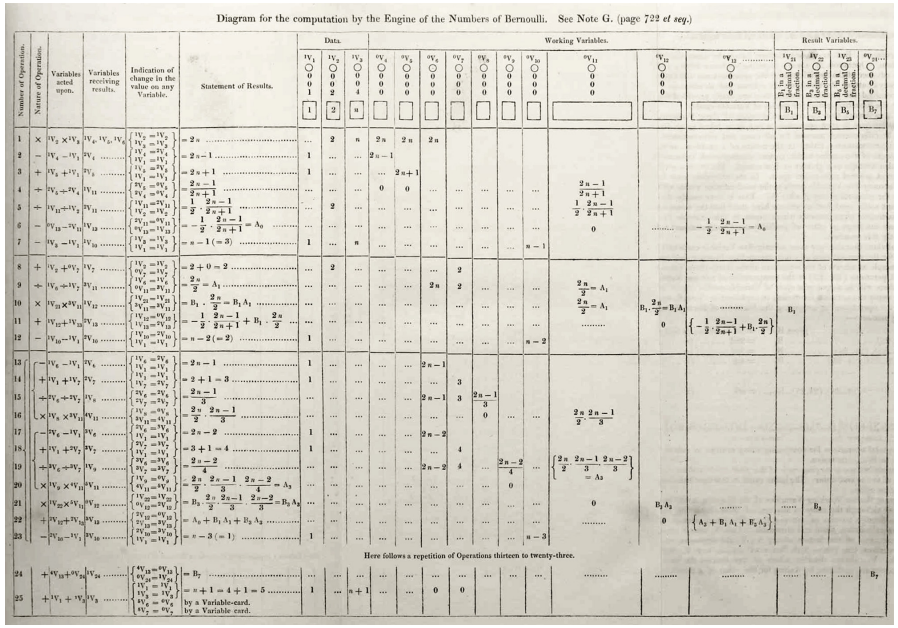
"The Ada Lovelace Centre (ALC), is an integrated, cross-disciplinary data intensive science centre, for better exploitation of research carried out at large scale National Facilities including the Diamond Light Source, the ISIS Neutron and Muon Facility, the Central Laser Facility and CCFE."

→ **Collaboration between STFC and CCFE to develop generic VVUQ software**



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Uncertainty Quantification

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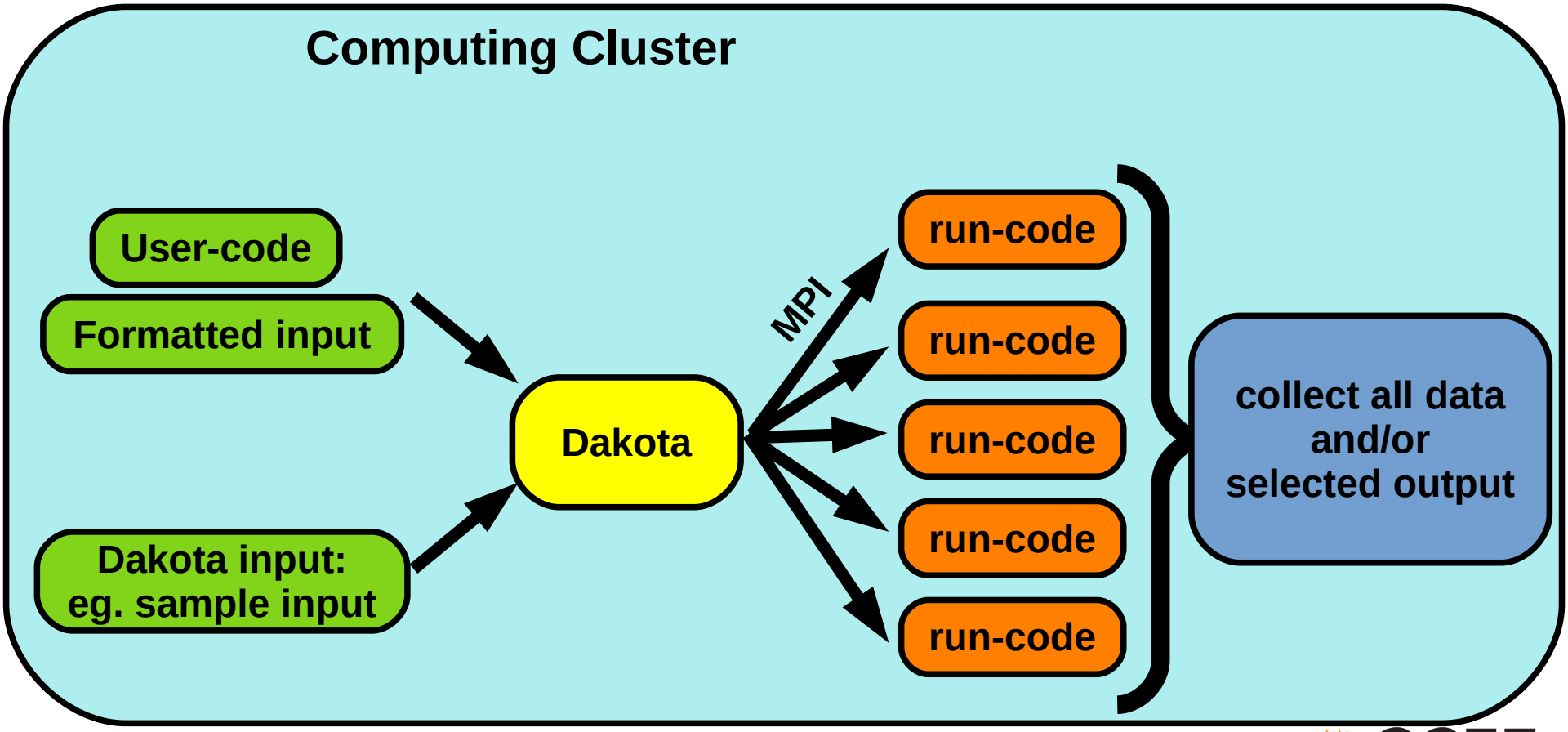
Dakota software for UQ:
https://dakota.sandia.gov/

DAKOTA
Explore and predict with confidence.



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Uncertainty Quantification

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Dakota software for UQ:
https://dakota.sandia.gov/

DAKOTA
Explore and predict with confidence.

Pros: - large range of UQ methods
(error sampling, input optimization)
- scalable to large jobs on HPC-clusters

Cons: - heavy learning curve (even for simple sampling)
- complex input files
- requires an HPC-cluster for full potential
- parallelisation only with MPI

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VVUQ Apps at CCFE

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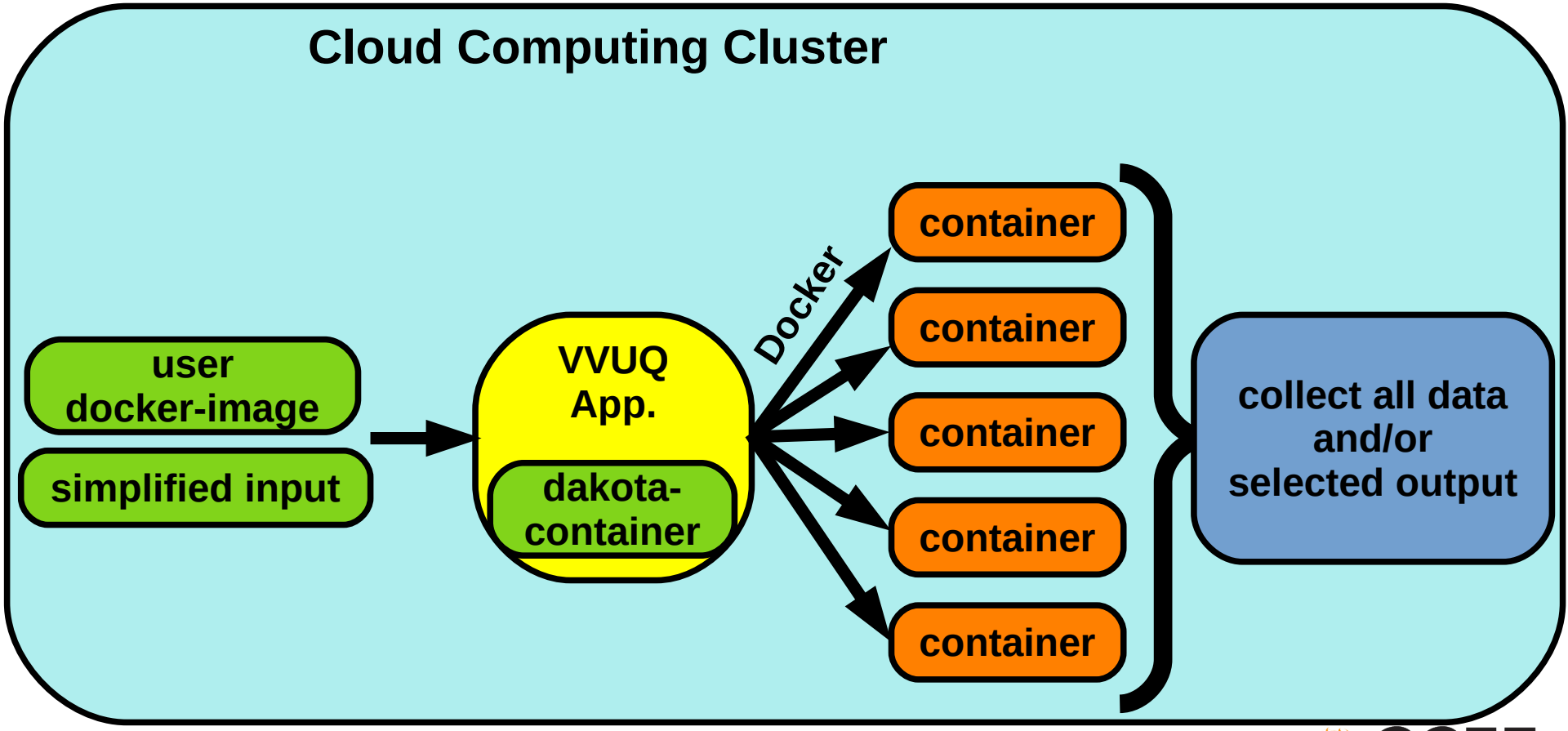
Two parts:

- access-layer around Dakota → simplified user input
- container interface → parallelisation using Cloud-Comp



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VVUQ Apps at CCFE

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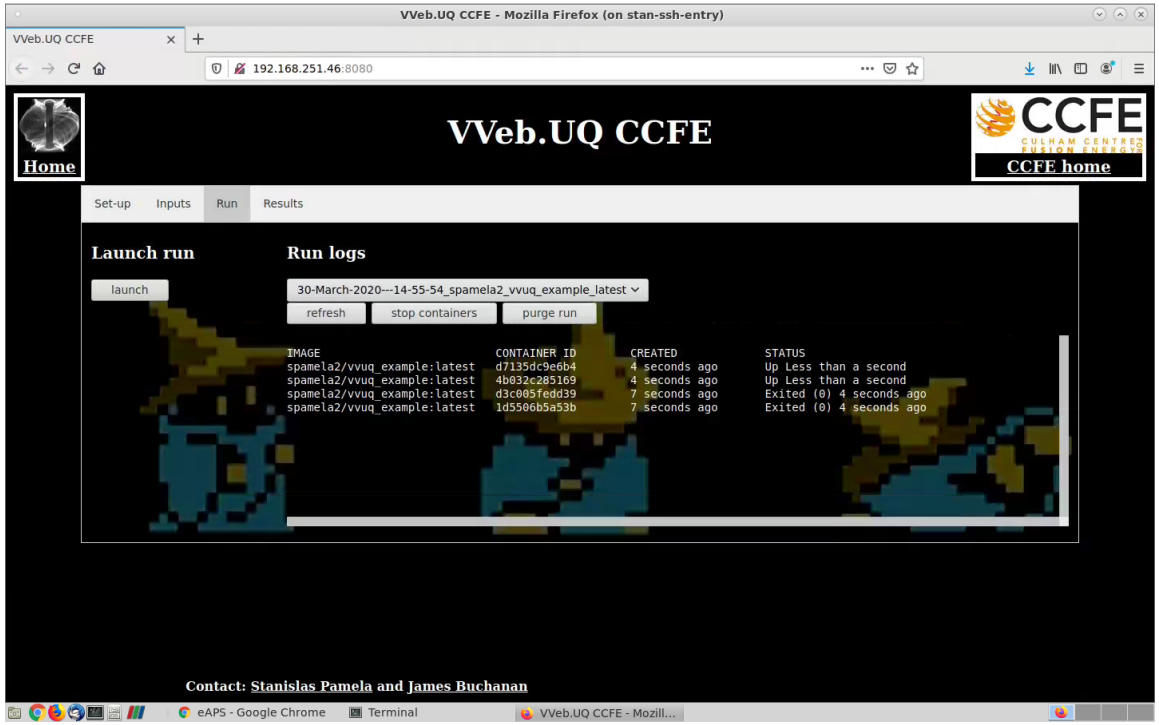
Main app embedded in web interface (server also launched as container)



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Next Developments

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Launch on remote Cloud-clusters, with 2 options:

- **deploy app (web-server) on a remote cluster → run there**
- **deploy app locally → send containers to remote clusters**
  → use Prominence (A.Lahiff)?

Integrate alternatives to Dakota:

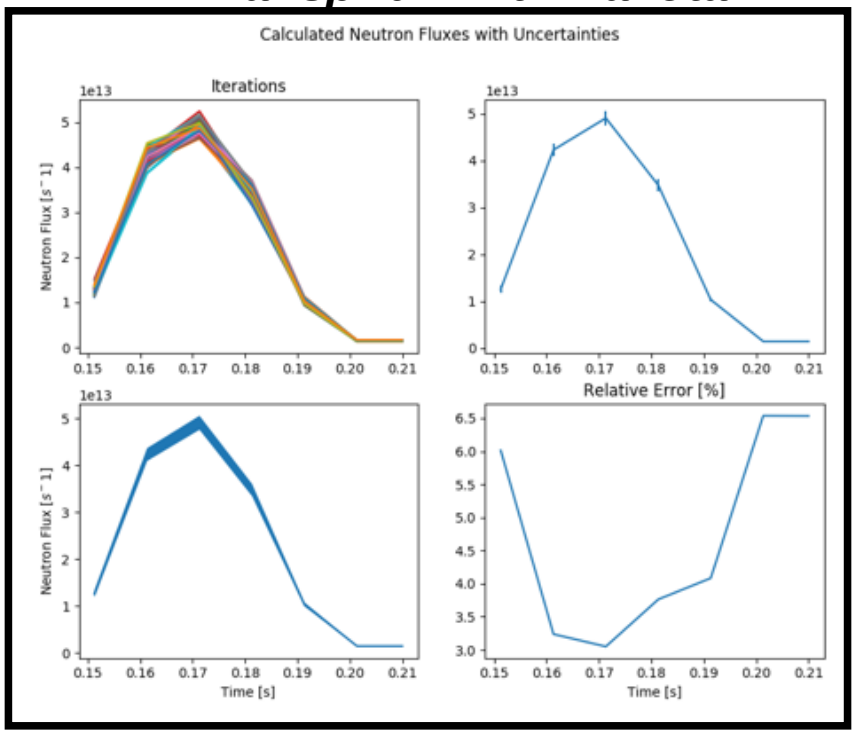
eg. VECMA https://www.vecma.eu/

Understand requirements for STEP

Demonstrate application on MAST-U

eg. EFIT, TRANSP

Transp run with Dakota



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