Matthew Griffith – Motivation letter for the Summer School on Effective HPC for Climate and Weather

My name is Matthew Griffith and I am a final year PhD student at the University of Bath. My PhD research is focused around the extension of the Met Office's Unified Model to the Mesosphere and Lower Thermosphere.

My areas of interest neatly overlap with those of the summer school – I have had experience in areas such as code development, middleware and file formats as well as post-processing and visualisation over the course of my PhD. Having worked in this area, I know the difficulties that can be encountered and I believe the summer school will be able to help me fill some gaps in my knowledge, and teach me details of these subjects in a more rigorous manner.

This summer school also covers areas which I have not been exposed to over the course of my PhD. In particular, big data analytics and machine learning are very much relevant in my research area, and attending the summer school would be a great opportunity to gain some knowledge here, which could be crucial in my development as a young researcher.

It is with this in mind that I am very interested in attending your Summer School on Effective HPC for Climate and Weather. In particular, I am very interested in the application of big data analytics and machine learning in the context of weather and climate predictions. I also look forward to meeting Peter Dueben, to learn about weather and climate research at ECMWF; I am intending to apply for research positions at ECMWF, and meeting Peter Dueben will be a great stepping stone to achieving this goal.

For the academic group project, my project idea is to develop a data visualisation package which has the capability to take model output and perform requested analysis within a GUI (such as zonal means, atmospheric tides etc.) as well as compare the model output to satellite or radar data to act as a first step towards model validation. The outputs from this project could have a real and direct impact on users of weather and climate prediction models. There is also a great need for open source code that is capable of performing this kind of comparison and visualisation of model output.

This project will incorporate the topics of Code Development, Post-Processing and Visualisation, Software Engineering and Supporting Tools. I would also like to see if Machine Learning is able to help with the visualisation algorithms.

Within my PhD research I have had much experience in data visualisation and Python coding for post-processing with output from the Met Office's Unified Model. Therefore, I will be able to use this expertise to help develop the project idea and bring together information from fellow group members. I will also be able to use the experience I have gained throughout my PhD to contribute to the project, and hope have real impact in weather and climate post-processing and visualisation.