

6. PEST_HP-Specific Output Files

6.1 General

PEST_HP records the same suite of output files that other versions of PEST record (with the exception of file *case.mtt* which provides a linear approximation to the posterior parameter covariance matrix in over-determined parameter estimation contexts). However it records some extra output files (in addition to the optional run results file described in the previous section); these are now described.

6.2 Objective Function Record File

Unless it is run using the “/f” command line switch, PEST_HP writes an “objective function record file” named *case.ofr* (on the assumption that the governing PEST control file is *case.pst*). This file contains a table which links the value of the objective function, and components thereof, to the iteration number of the inversion process. It is updated at the beginning of each iteration. This file is easily imported into a spreadsheet or graphing package for visual tracking of PEST_HP progress.

Where PEST_HP is run in “regularisation” mode, the objective function record file lists values for the measurement and regularisation objective functions, as well as for the objective function components associated with all non-regularisation observation groups. It does not provide objective function values for regularisation groups as these are non-comparable between iterations; they are subject to multiplication by the regularisation weight factor, and to inter-group weight factor adjustment as designated by the value of the IREGADJ regularisation control variable.

Where PEST_HP is run in “estimation” or “pareto” modes, the objective function record file lists values for the total objective function, and for the objective function components associated with all observation groups.

6.3 Parallel Run Efficiency File

Suppose that PEST_HP is run on the basis of the PEST control file *case.pst*. In common with BEOPEST, PEST_HP records parallel run management details in a file named *case.rmr* (the parallel run management record file). In contrast to BEOPEST however, PEST_HP records an additional “parallel run efficiency file” named *case.rme*. This file contains a table which can be easily imported into a spreadsheet or graphing package for plotting. For each parallel agent, the parallel run efficiency file records:

- the agent’s working folder;
- the current status of the agent (active, idle or lost);
- the number of model runs carried out by the agent;
- the number of run failures encountered by the agent;
- the number of times that a run undertaken by the agent was abandoned or assigned to another agent;
- the number of successful model runs carried out by the agent;
- the maximum, minimum and average model run times (in seconds) encountered by the agent;
- the cumulative run time (in seconds) over all model runs undertaken by the agent;

- the cumulative time (in seconds) over which the agent has existed;
- the parallel run efficiency of the agent (calculated by dividing cumulative run time by cumulative existence time).

These statistics need some refinement for cases where different commands can be used to run the model in different circumstances, for example if multiple model commands are employed for the purpose of finite difference derivatives calculation, and/or if observation re-referencing is undertaken. This refinement awaits further PEST_HP development.

The parallel run efficiency file is updated every minute, or at the completion of every parallel package of model runs, whichever happens sooner.

PEST_HP issues a warning message to the screen at the beginning of each iteration of the inversion process if a particular agent has encountered run failures but no run successes. This may indicate that a file is missing or corrupted in that agent's folder.

6.4 Parameter Error File

See section 7.1.2.