



## Output radiation view factors and facet areas: FRAD

This example illustrates the use of a Fortran program to read the radiation view factors and the facet areas from the results file.

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**Products:** Abaqus/Standard

### General description

The program shows how to retrieve the view factors and the facet areas from the results file. The results file created from the benchmark problem detailed in [Axisymmetric elemental cavity radiation view factor calculations](#) is used to verify that the output records have been read and output correctly. This program will assume that the results file has the default file extension, `.fil`, which corresponds to Fortran unit 8.

### Programming details

Before proceeding, review the general discussion on programming concepts and Abaqus Fortran interfaces in [About user postprocessing of Abaqus results files](#) and the detailed discussion of postprocessing given in [File Output Format](#).

When running the program `FRAD` (this program is named `frad.f` on the Abaqus release media), the user will be prompted for the file name that initializes `FNAME`. Other variables, such as `LOUTF`, `NRU`, `LRUNIT(1,NRU)`, and `LRUNIT(2,NRU)`, are initialized inside the program. `INITPF` and `DBNRU` are then called to complete the necessary initializations and file connections. By default, the results file is processed for all steps and increments in the results file. The user can restrict the output by setting `LSTPEA` and `LINCA` to the required step and increment and uncommenting the simple `IF - END IF` block. Data processing starts with a `DO`-loop over all the records to be read, one-by-one, by means of a call to `DBFILE`. Each record is identified by its record key, which is stored in the second entry of the record. When records 1922 and 2000 are processed by `FRAD`, the heading and the current step and increment numbers are written out so as to provide a way to recognize the beginning of data in each analysis. Record types 1605, 1606, 1607, and 1609 are then read; and the desired output is written to the output file `vfout`.

## Program compilation and linking

Before it can be executed, the Fortran program must be compiled and linked. Both operations, as well as the inclusion of the `aba_param.inc` file, are performed by a single execution of the **abaqus make** utility:

```
abaqus make job=frad
```

This procedure may have to be repeated until all Fortran errors are corrected. After successful compilation, the program's object code is linked automatically with the Abaqus object codes stored in the shared program library and the interface library to build the executable program. Refer to [System customization parameters](#) for information about the compile and link commands for a particular computer.

## Program execution

Before the program is executed, a results file must have been created with the desired output being written to that file. In this example the results file `xrvda4n1.fil` created by running the input file `xrvda4n1.inp` discussed in [Axisymmetric elemental cavity radiation view factor calculations](#) is used. When the program is executed using the command `abaqus frad`, the prompt

```
Enter the name of the input file (w/o .fil):
```

will appear. Enter `xrvda4n1` to define `FNAME`. The program processes the data and produces a file named `vfout`, which contains the required information.

## Results and discussion

The radiation view factors and facet areas are read and output to `vfout`. The output agrees with the expected results.

## Input files

### [frad.f](#)

Postprocessing program.