

## ZZZZ315 – Validation of the order PROD\_MATR\_CHAM (real matrix)

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### Summary:

The goal of the test is to validate the programming of the order PROD\_MATR\_CHAM for the real matrices (routine `mrmult.f`).

One checks 3 cases for boundary conditions **not** homogeneous:

- 1) Boundary conditions eliminated (AFFE\_CHAR\_CINE)
- 2) Boundary conditions dualized (AFFE\_CHAR\_MECA + DDL\_IMPO + LIAISON\_DDL)
- 3) Mixture between boundary conditions dualized and eliminated

## 1 Principle of the test

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2. Boundary conditions dualized (`AFFE_CHAR_MECA + DDL_IMPO + LIAISON_DDL`)
3. mixture between boundary conditions dualized and eliminated

For each case:

- One solves (orders `TO_FACTORIZE + TO_SOLVE`) a linear system  $K \times U = F$  with  $K$  and  $F$  known. One obtains  $U$ .
- One carries out then the product  $FF = K \times U$  with the order `PROD_MATR_CHAM` and it is checked that  $FF$  is equal to  $F$ .

## 2 Validation

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When the boundary conditions all are dualisées, it is checked that  $FF$  is quite equal to  $F$  on all the degrees of freedom.

On the other hand, when there exist boundary conditions eliminated,  $FF$  is not equal to  $F$  that on the not eliminated degrees of freedom. On the eliminated degrees of freedom,  $FF$  is null.