1 Goal

To define the geometry of the places of shocks of a telegraphic structure. These places are defined in a plan perpendicular to the structure modelled by beams $POU\_D\_T$ and $POU\_D\_E$. It is then used by $DYNA\_TRAN\_MODAL$ [U4.53.21] for the study of the answer of a structure whose displacements are limited by the presence of this obstacle. One can also define the initial section of a structure which one will study progressive wear. In this last case, the concept will be used by $MODI\_OBSTACLE$ [U4.44.22].

Product a concept of the type table_fonction.
2 Syntax

obstacle = DEFI_OBSTACLE
   (  / TYPE = / 'CIRCLE', [DEFECT]
      / 'PLAN_Y',
      / 'PLAN_Z',
      / 'BI_CERCLE',
      / 'BI_CERC_INT',
      / 'BI_PLAN_Y',
      / 'BI_PLAN_Z',
      / 'DISCRET',
     ◊ VALE = thetar, [l_R]
     ◊ VERIF = 'FIRM',
   )
3 Operands

3.1 Operand TYPE

The operand TYPE allows to give the form wraps game in the connection of shock by a text among the following: PLAN_Y, PLAN_Z, CIRCLE, DISCRETE, BI_PLAN_Y, BI_PLAN_Z, BI_CERCLE and BI_CERC_INT;

Obstacles of the type PLAN_Y, PLAN_Z, CIRCLE and DISCRETE define the geometry of the places of shock between a mobile structure and an indeformable obstacle. They are traced below [Figure 3.1-a] according to the selected type.

\[
\begin{align*}
\text{PLAN}_Y & \quad \text{PLAN}_Z & \quad \text{CIRCLE} \\
\text{Zloc} & \quad \text{Zloc} & \quad \text{Zloc} \\
\text{Yloc} & \quad \text{Yloc} & \quad \text{Yloc} \\
\text{jeu} & \quad \text{jeu} & \quad \text{jeu}
\end{align*}
\]

Figure 3.1-a

The value of the game and the local reference mark \((X_{loc}, Y_{loc}, Z_{loc})\) will be defined at the time of the use of the obstacle (see operator DYNA_TRAN_MODAL [U4.53.21]). The origin of this reference mark being the place of the telegraphic structure considered.

In the case of the obstacle \(\text{TYPE} = \text{DISCRET}\), the curve should be specified defining contour and the game simultaneously, using the keyword VALE.
Types BI_PLAN_Y, BI_PLAN_Z, BI_CERCLE and BI_CERC_INT allow to define the possible places of contact of the telegraphic structure between two nodes NO1 and NO2 belonging each one to a mobile structure. The geometries of the connections of contact plan on plan (or rings on circle) are described on the figure [Figure 3.1-b] below.

![Diagram of BI_PLAN_Y and BI_PLAN_Z](image)

**Figure 3.1-b**

The value thicknesses of matter surrounding the nodes of shock (D1 and D2 for an obstacle of the type BI_PLAN_*, R1 and R2 for an obstacle of the type BI_CERCLE or BI_CERC_INT) as well as the local reference mark (Xloc, Yloc, Zloc) is defined at the time of the use of the obstacle, it is - with-to say in the operator DYNA_TRAM_MODAL [U4.53.21].

Several initial forms, in particular for the study of the vibrations of the control rods, are defined. They correspond with the pencil of the various control rods and to their guidance.

### 3.2 Operands VALE / VERIF

◊ VALE = thetar

In the case of the obstacle DISCRETE the curve should be specified defining contour and the games simultaneously, using the keyword VALE.

thetar is the list of realities allowing to describe the contour of the obstacle of the type DISCRETE in polar coordinates. One describes the obstacle like a plane curve into polar by giving
couples of values, the first being the angle in degrees of 0 with 360°, the second the ray [Figure 3.2-a].

\[ \text{VERIF} = 'FIRM' \]

Keyword allowing to check if the curve given into polar is well closed.

\[ \text{VALE} = (0.0, 0.00086, 30.0, 0.001, 90.0, 0.001, 150.0, 0.001, 210.0, 0.001, 270.0, 0.001, 330.0, 0.001, 360.0, 0.00086,) \]