# Limiter File Structure

## General Idea

The limiter description currently consists of a set toroidal regions. Each regions starts with a main polygon that contains the plasma. Inside this polygon additional polygons can be defined that represent obstacles e.g. coils. A track will typically be stopped if it leaves the main polygon or is inside one of the obstacles

The file is a simple ASCII file and should have the following structure:

|  |  |  |
| --- | --- | --- |
| Line | Content | Example: |
| 1 | Some descriptive comment | limiter file for MAST-U |
| 2 | N\_tor | 3 |

This is followed by N\_tor data sets of the form:

|  |  |  |
| --- | --- | --- |
| Line | Content | Example |
| 3 | Some descriptive comment e.g. | -- Region 1 -- |
| 4 | Toroidal angle (in deg.) of the start of this region | 0. |
| 5 | Number of polygons Np | 5 |
| 6 | n1 n2 n3 …nNp : Number of vertices for each polygon | 28 4 4 4 4 |
| 7 | r1 z1 | 2.0 -2.00 |
| 8 | r2 z2 | 1.392 -2.00 |
| 9 | … | … |
| 34 | rNp zNP | 2.0 2.00 |
| 35 | Blank line |  |
| 36 | Next polygon: r1 z1 | 1.40425 1.195 |
| 37 | r2 z2 | 1.59525 1.195 |
| 38 | r3 z3 | 1.59525 1.005 |
| 39 | r4 z4 | 1.40425 1.005 |
| 40 | Blank line |  |
| 41 | Next polygon … | … |
| 42 | Etc. | … |

|  |  |  |
| --- | --- | --- |
| Line | Content | Example |
| 3 | Some descriptive comment e.g. | -- Region 2 -- |
| 4 | Toroidal angle of the start of this region | 20. |
| 5 | Number of polygons Np | 5 |
| 6 | n1 n2 n3 …nNp : Number of vertices for each polygon | 25 4 4 4 4 |
| 7 | r1 z1 | 2.0 -2.00 |

Etc. for all toroidal regions.

At the moment all geometric structures are rotational forms around the z-axis. Therefore a

Square with an angular range of 2p corresponds to a ring with a square cross section (e.g. for a coil). At the moment irregularly shaped objects need to approximated with toroidal and radial regions.