TOFU'S BENCHMARKING
AWP18-EEG-CEA-MENDOZA

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1. Starting Point

ToFu's versioning is set automatically with each `git` tag. We will set as a reference point the version number `1.3.22-6-g45cb446`, which also corresponds to the `git` tag.

1.1. **Set of tests.** In order to have an extensive benchmarking, we need to set a series of tests configurations that will encompass the maximum scenarios, as well as allow us to test the speed-up of simple yet essential methods. Let us first define the different geometries:

- Tests with only a vessel:
  - Config A1:
    - WEST – V1 (realistic) : 63 points
  - Config A2:
    - TER – Test (artificial) : 551 points
  - Config A3:
    - WESTSep – Test (artificial, inspired by the separatrix of an experimental shock of WEST) : 1001 points

- Tests with a vessel and structural elements:
  - Config B1: 'min' (only axisymmetric structures)
    - Ves: WEST V0
    - Struct:
      - Baffle : Baffle-V0
      - Upper divertor : UpDiv-V1
      - Lower divertor : LowDiv-V1
  - Config B2: 'light' (same as B1 + some toroidal structures)
    - Ves: WEST V0
    - Struct:
      - Baffle: Baffle-V1
      - Upper divertor: UpDiv-V2
      - Lower divertor: LowDiv-V2
      - Inner Bumpers: InnerBumpers-V1
      - Outer Bumper: OuterBumper-V1
      - IC antennas: IC1-V1 + IC2-V1 + IC3-V1

- Config B3: 'full'
  - Ves: WEST-V0
  - Struct:
    - Baffle: Baffle-V2
    - Upper divertor: UpDiv-V3
    - Lower divertor: LowDiv-V3
    - Inner Bumpers: InnerBumpers-V3
    - Outer Bumper: OuterBumper-V3
    - IC antennas: IC1-V1 + IC2-V1 + IC3-V1
    - LH antennas : LH-V1, LH2-V1
    - Ripple : Ripple-V1
    - VDE : VDE-V0

We will also vary the number of lines sights $N_i = 10^i$ with $i = 0, \cdots, 6$.

TABLE 1. Execution time of unit tests 1 to 13, time computed as the mean of 5 runs

Machine	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Ubuntu	0.0003326	0.0003468	0.0001554	0.0003012	0.000482	0.0052582
Sirrah	0.0086206	0.0003952	0.0001658	0.00032	0.0005792	0.0081134
Atlas	0.0	0.0	0.0	0.0	0.0	0.0

Machine	Test 7	Test 8	Test 9	Test 10	Test 11	Test 12	Test 13
Ubuntu	0.0476964	0.005901	0.0350598	0.0479324	0.1106498	0.0283896	0.0061352
Sirrah	0.0516274	0.006856	0.046948	0.05907	0.132117	0.036295	0.0066378
Atlas	0.0	0.0	0.0	0.0	0.0	0.0	0.0