Manlab : Updates of the version 4.1.5

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May 28, 2019

1 Important remark

The continuation of quasi-periodic solutions with `@SystHBQ_QP` or `@SystODE` is possible normally only if there are no transcendental functions (`dL`, `dQ` operators).

Otherwise, the following condition must be fulfilled : if transcendental functions are required for the recast of the system, for example `Ra_1 = e - exp(u)`, then its differentiated form is given by `dRa_1 = de - e*du`, an additional variable must be added **right after u** and being equal to its derivative. The equation satisfied by this variable, `v` for example, is simply `v - du = 0`.

If you are willing to use this possibility, please feel free to contact the authors of the code for a detailed example.

2 Bugs fixed

- In the function `init_Hopf.m` of the class `@SystHBQ`, the occurences of `zi_phase` were wrongly written `zi_phase1`, causing issues when trying to initialize the periodic solution arising from a Hopf bifurcation.
- For the class `@SystODE` and for autonomous systems, when the stability of an equilibrium is computed the eigenvalue equal to zero is removed. This was causing issues when searching for the precise bifurcation point of a system in the presence of a Hopf bifurcation.
- The detection of bifurcation is now more robust. The previous algorithm was based on the smaller absolute real part of an eigenvalue. It is now based only on the number of eigenvalue with positive real parts.

3 Changes

- The default values of `NRthreshold` and `ANMthreshold` have been set to `2e-5` and `1e-6` respectively. This matches the default value `1e-3` of `StabTol` when computing the stability of a solution.
- The condition under which the Floquet exponents have reach convergence has been change in the stability computation of periodic solutions (classes `@SystHBQ` and `@SystODE`). It is now only required that at least `nz/10` Floquet exponents have reach convergence.

4 Additional possibilities

- The example `Examples_HBQ/Duffing_stab` shows now an example of a scripted use of **Manlab**.
- The example `Examples_AQ/Logisticmap` has been added. The operators C, L, Q are provided directly to achieve an instant initialization of the system. It allows to treat (very) large system without the drawback of a long initialization time.
- The functions in the repertory `SRC/Display` used in the user defined `global_display.m` function have been updated so that they can be used as post-processing display function that work directly on a cell of CheckPoint objects (a cell of Section structures), called a "Diagram" in the code.