LHC MD on Landau damping threshold

- Motivation:
  - Since spring 2012, many instabilities observed at various stages of the physics fills (flat top, squeeze, adjust, or collision).
  - Single-beam MD in June tested the octupole instability threshold (negative polarity)→ between -20 A and -240 A, depending on chromaticity → more stable than during two beams operation.
  - For some instabilities (end of squeeze), possible explanation was compensation of the octupole tune spread due to long-range interactions → octupole polarity reversed in summer.
  - But instabilities at the end of squeeze are still observed, even with very high positive octupole current (510 A)
  - One possible explanation (mentioned by S. Fartoukh): external non-linearities (in the triplets ?) could compensate partly the octupoles with new polarity.

    => To check this : re-do single-beam MD with positive octupole polarity.

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- Beam conditions: same as previous singe-beam octupole MD in June:
  - Beam 2 only (beam 1 filled with a non-colliding nominal intensity bunch)
  - Scan octupole current, at 4TeV after squeeze.
  - Intensity as in normal operation (1380 bunches, 1.4e11 p+/bunch).
  - Tranverse feedback on: damping rate 50 turns in x, 100 turns in y (time allowing, try several values: 50, 100, 200).
  - Emittances ~2 mm.mrad.
  - Chromaticity: if possible test as many as possible: -5, 0, +5, +15.
  - Collimators as in normal operation (no movement).
  - Special instrumentation requirement: fast BSRT scan (if available).
  - MPP class: C / D.

- VERY IMPORTANT: check (again) chromaticity dependence vs. octupole current (before or after MD).

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- MD plan:
  - After ramp and squeeze: control chromaticity to +5, set octupoles to +510A (as in normal operation).
  - Reduce octupole current by 20A steps until BBQ signal increases (wait ~2 minutes per step).
  - Before damaging the beam, re-increase octupoles to 510 A, to stabilize the beam.

- Redo this for other chromaticities (+15, then 0, then -5), and if possible several values of the damping rate.