Status on 26/10/2018

=> XavierB is currently at the CAS and we could come back with more detailed answers in the future

1. From 13/11/2015: Stephane mentioned studies of S. White with IP8 separation showing small DA or emittance blow-up. Do we see that in strong-strong simulations?
2. From 27/11/2015: Following the discussions at the meeting on 27/11//2015 and in Beam-Beam meeting with presentation from Y. Alexahin define the constraints (if any) on beam stability on the IP1-5 phase advance difference between beam 1 and beam 2. Is there any "coupling" effect between the damper action on each beam via the beam-beam? Is the coupling of the action of the damper on B1(2) to B2(1) via beam-beam taken into account in Nested Head-Tail or in DELPHI? => Not in DELPHI but I think A. Burov did something like this with NHTVS.
3. Following the presentation of X. Buffat at the Annual meeting (https://indico.cern.ch/event/549979/contributions/2263213/attachments/1371406/2080727/2016-11-15_BBOP-expanded.pdf) do we understand why the strong-strong simulations with damper are providing optimistic results?
4. TRAIN upgrade:
    1. Global luminosity optimisation is still missing.
9. Need to verify that the proposed operational scenario (CERN-ACC-NOTE-2018-0002) with negative octupoles is robust both for the nominal and ultimate scenarios from the point of view of DA including beam-beam effects and taking into account of PACMAN effects. Verify with respect to the two polarities of ALICE and LHCb and with realistic separations
    - verification at injection (Requirements on crossing angle and separation at all points at injection. Define the minimum crossing angle and separation at injection from beam-beam effects (transients at injection, etc.)
    - verify the stability through ramp and squeeze and squeeze (also including the case with reduced crossing angle at the beginning of the fill)
    - collision process and stable beams (also including the case with reduced crossing angle at the beginning of the fill):
        1. Evaluate stability and orbit offsets due to PACMAN effects
            1. at crab cavities
            2. at collimators
            3. at electron lens
        2. Evaluate the dynamic effects (tune, orbit, chromaticity) when going in collision for with levelling by separation in IP2 and particularly IP8
        3. Evolution of the PACMAN effects during the fill
        4. Evaluate impact of PACMAN effects on luminosity
        5. Effect of noise to be included (vibrations, ripple of the power converters of the main magnets and triplets/matching section, noise of feedback and crab cavities, effect of feedback, effect of beam beam)
        6. ACTION (Xavier, Ariadna): Check if the filling scheme and/or phased advance can be optimized for the number of collisions in IP2,8 to lower the effects on PACMAN bunches.
        7. ACTION (Xavier, Ariadna): Study the impact of orbit errors on linear coupling of PACMAN bunches and define the tolerances
    - Most of it done (see presentation at WP2 meeting on 12/6/2018 (https://indico.cern.ch/event/733521/). Need to document in a note and distribute to relevant WPs: Action: Xavier

    => Most of it is done, Ariadna wrote a detailed note but XavierB is still reviewing it.

5. Update after meeting on 18/4/2017 (https://indico.cern.ch/event/632391/attachments/1456956/2248683/Minutes_92WP2_20170418.docx) PACMAN effects:

    1. Action: Xavier to evaluate the impact on luminosity of long range effects for 8b+4e.
    2. Evaluate the dynamic effects (tune, orbit, chromaticity) when going in collision for:
        1. Flat optics

6. From WP2 Meeting on 08/05/2018 (https://indico.cern.ch/event/726041/): PACMAN bunches having different orbits might feature different separations during the collision process and cross minimum of stability at different timings. Action: Xavier to verify
7. Estimate the expected beam-beam kick and orbit distortion in case of a dump of a single beam
8. Can we exclude operation with a crossing angle at 45 degrees? Do we have simulations for that case? It could allow changing regularly the orientation to minimize radiation. Advantages/disadvantages for machine protection?
9. Define tolerances on bunch-to-bunch population and emittance (also H/V differences) from beam-beam considerations.