INTC statement

The authors of this letter of intent propose to perform proof-of-principle tests of a high-power production target station as needed for a Neutrino Factory or a Muon Collider. The target consists of a free mercury jet situated inside a 15T solenoid and would be installed in the n-TOF tunnel.

The committee saw the tests as very useful, but questions regarding the implications for CERN and the nTOF scientific program would have to be addressed in discussions with the implicated local groups, pending the outcome of an application to the EC.

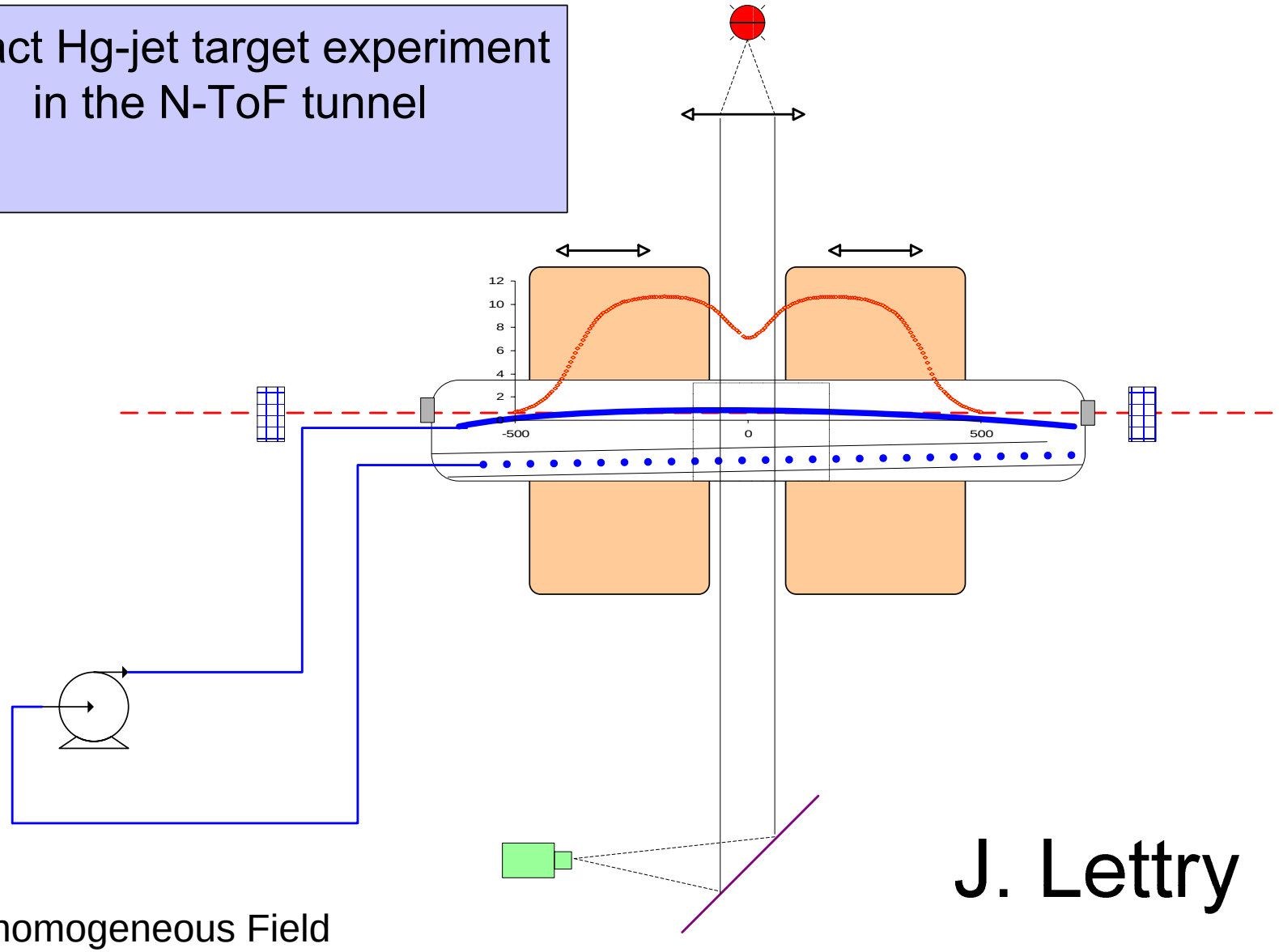
Condition: No interference with the n-ToF program

Furthermore, the major effort in machine development needed to deliver 8 PS bunches in one extraction cycle was highlighted. In conclusion, the committee welcomed the physics case and took note of the current document.

Hg jet target test in the n-ToF tunnel

- Safety
  - Double confinement
  - Minimum # of pulses (< 50)
- Volume constraints
  - Smart pulsed pump ~ 0.5-1.0 s
    - dV/dt ~ 1 l/s (volume 3-4 l)
    - Equally smart Hg recuperation system
- Measurement and access to the setup
  - Magnet ramping + Pump or Hg-jet induced shocks will affect the previously used mirror optics (frequent tuning).
  - Therefore, the tuning of the optics must be independent from the Hg-loop and Magnet coil
  - No mobile parts inside the coil.
- The jet velocity will follow the cycle of the magnet and spray at various height into the collection tank.

Nufact Hg-jet target experiment in the N-ToF tunnel



Inhomogeneous Field
in the interaction region

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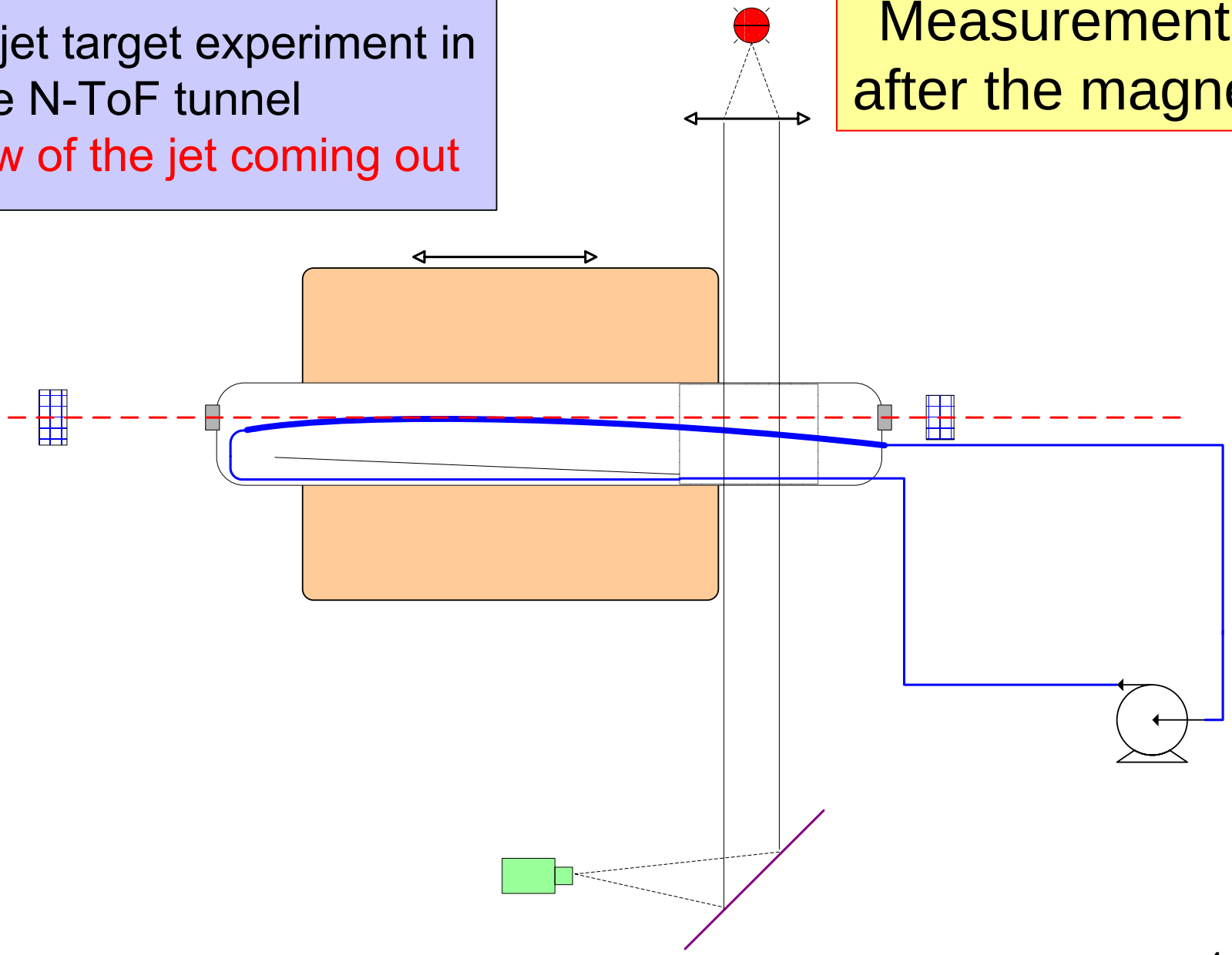
Nufact Hg-jet target experiment in the N-ToF tunnel

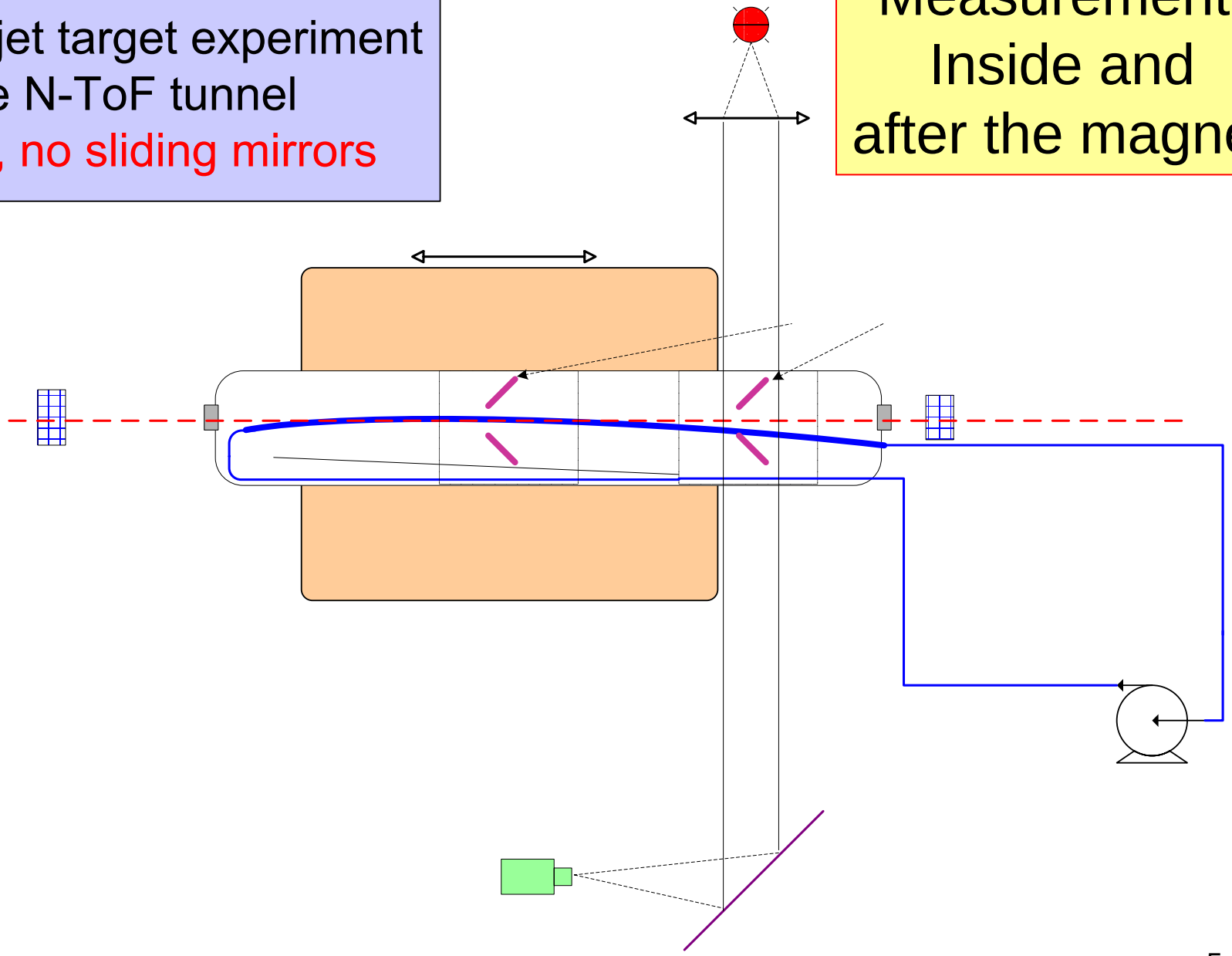
1-coil, view of the jet coming out

Measurement after the magnet



Nufact Hg-jet target experiment
in the N-ToF tunnel
classical, no sliding mirrors

Measurement
Inside and
after the magnet



Post conf. comments

- These propositions of course should trigger the dialog on the design. No exp. scheme should be excluded at that stage.
- Scheme with a jet a duration larger that 1 s are not excluded. (an example is attached in slide 7)
- The ramping up and down of the magnet may induce movement on mobile mirrors. And we should keep in mind that the ramping B-field will affect the velocity of the Hg-jet and its collection height.
- The observable and the range of the various parameters to be investigated should be discussed in one of the next video conf.

Nufact Hg-jet target experiment in the N-ToF tunnel

classical + Hg tank for ~dc-pump