# A stand-alone BGC for the LHC

Ray VENESS

# Introduction

- Upto now, the main aim of this collaboration was to produce an overlap monitor for the HEL as part of the HL-LHC project
  - This has changed following the descoping of the HEL from the HL-LHC project
- HL continue to support this collaboration, but with different goals
  - Develop an instrument that would be available for a future re-introduction of a HEL in HL-LHC
  - Maximise the physics potential for CERN of the BGC instrument
- New goals for the two final v4 deliverable BGCs as operational instruments
  - Monitor for hollow e-beams in the EBTS
  - A second operational BGC as a stand-alone monitor in the LHC for protons and ions

# What would a stand-alone BGC look like?

- We are somewhat free to choose a location
  - No (significant) magnetic field
  - More space for integration on Beam 2
    - Use the existing v3 mechanical design?
    - Additional vacuum pumps upstream and downstream on the beamline
- Optimise the design for P+ and ions
  - Smaller 3$^{rd}$ skimmer, reducing gas load and background
  - Modify the optical system for the smaller targets and ?
- We could reconsider the working gas
  - N2, with the larger x-section would give more signal
  - N2 is cryo-pumped (and NEG pumped) giving other layout options
    - Can we learn from the EBTS work?
- We would need an 'operational' instrument for both v3 and v4
  - What do we mean by operational? Used by operators without expert presence?
  - Add the automation layer to the vacuum control system
  - Add acquisition and operational GUI for use in the CCC

# Summary

- We should be able to produce an instrument with a significantly (to be quantified) better performance for p+ and ions

- We only have ~15 months on the HL-UK2 collaboration, so we need to take the right strategic choices with the time and people available

- We need to make a complete costing and then find the budget to allow for integration and installation (during LS3?)