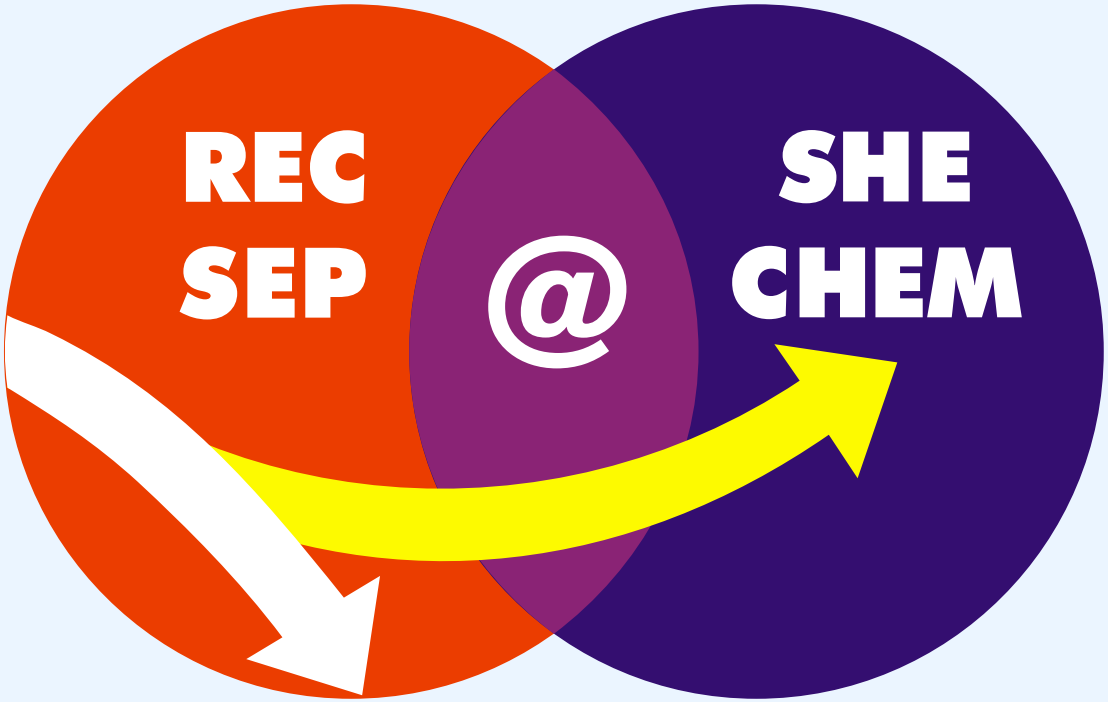
STATUS of TASCA – A Brief Overview

Including the report on Task Group C 2. (separator, mechanics) activities



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http://www.gsi.de/tasca

TASCA – Status

Recommendation to build **TASCA** by the Scientific Council of GSI and positive response / funding by the GSI directorate (end of 2004)

The project started January 2005 !

The present situation, September/October 2005)

* UNILAC beam line (X8/9) selected (close to a chemistry laboratory),
  - previously installed experiment moved to the newly built beam line Z7 and
  - TASCA beam line installed ✓
    -- Beam diagnostics (2 wire grids, luminescence screen) under construction
    -- Faraday cups ✓
    -- Wobbler design: 2006 – needs work !

* Shielding (calculations performed and accepted from "authorities"; I (^{40}Ar) ≤ 30 µA ✓)
  -- Concrete walls ✓ -- Shielding doors ✓
  -- Additional floor, roof and "experiment" shielding existing ✓
  -- Concrete roof: end of October 2005
  -- Integration of X8 into the UNILAC "Control and Access System": December 2005

TASCA – Status: The present situation (September/October 2005)

* *Window-less operation* (differential pumping) ("A") "in principle" operational
  – first successful tests ✓
    -- still room for improvements using bigger roots and roughing pumps
    -- tubes (collimators) to connect the 3-sections + holder need to designed / build

* TASCA *ion-optical calculations, design studies*, .. ("C 1.")
  - Phase I completed: TRANSPORT calculations (A. Semchenkov GSI/TUM) + ✓
    Magnet modeling (Efremov Inst.) ✓
    → design and construction of a new -- dipole vacuum-chamber ✓
    -- quadrupole vacuum-chamber ✓
    (to be installed in October 2005, ("C 2."))

  - Phase II (present): better, more refined model calculations (GICO, ...)
    -- solve problems w/ conflicting product momentum distrib. behind targets

* *Control (separator, vacuum, beam diagnosis ...) and Safety System:*
  - Development started; however needs much more work

TASCA – Status: The present situation (September/October 2005)

* *Target* (chamber, size, drive, control, ...,) ("B"): Design and tests (e.g. drive, targets) ✓

- target chamber and cassette (outer dimensions) compatible w/ BGS wheel design ✓

- near future (< 30 % duty cycle): existing 3-segmented *ARTESIA* wheel (2000 rpm) ✓
- stepping motor and motor control was successfully tested (2000 rpm, in vacuum) ✓
  w/ photoelectric switch fiber unit w/ amplifier (Omron) ✓

- distant future (50% duty cycle): same wheel w/ one half-wheel segment (3000 rpm)

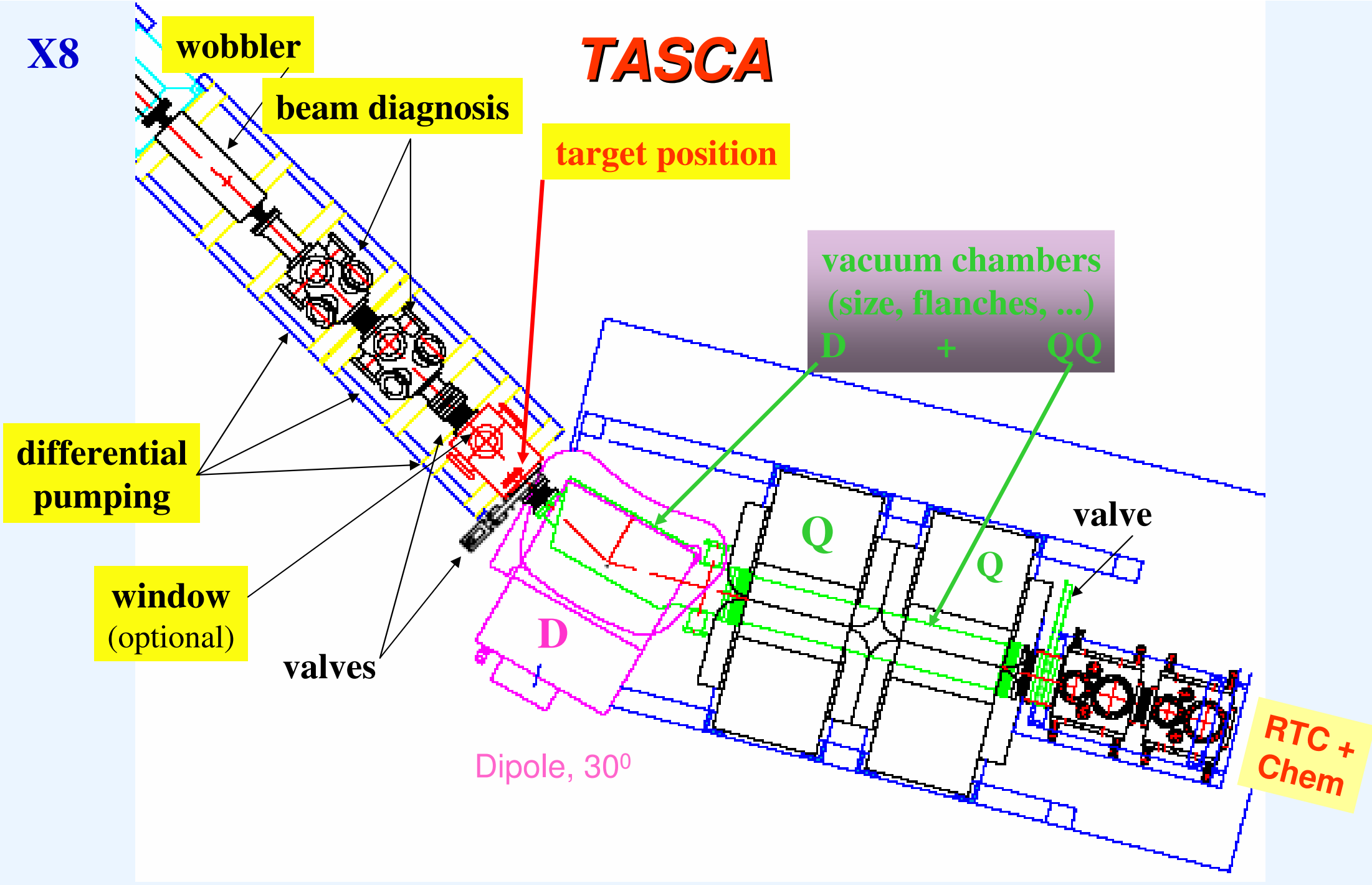
* *Focal plane – Detectors* ("D 1."):
  - 1st generation stop detector will be built from existing (old SHIP) components
    -- components exist
    -- not yet installed or tested; open questions about locations, cabling, ...
    -- use part of SHIP data acq ? – or separate / independent ? – where ?

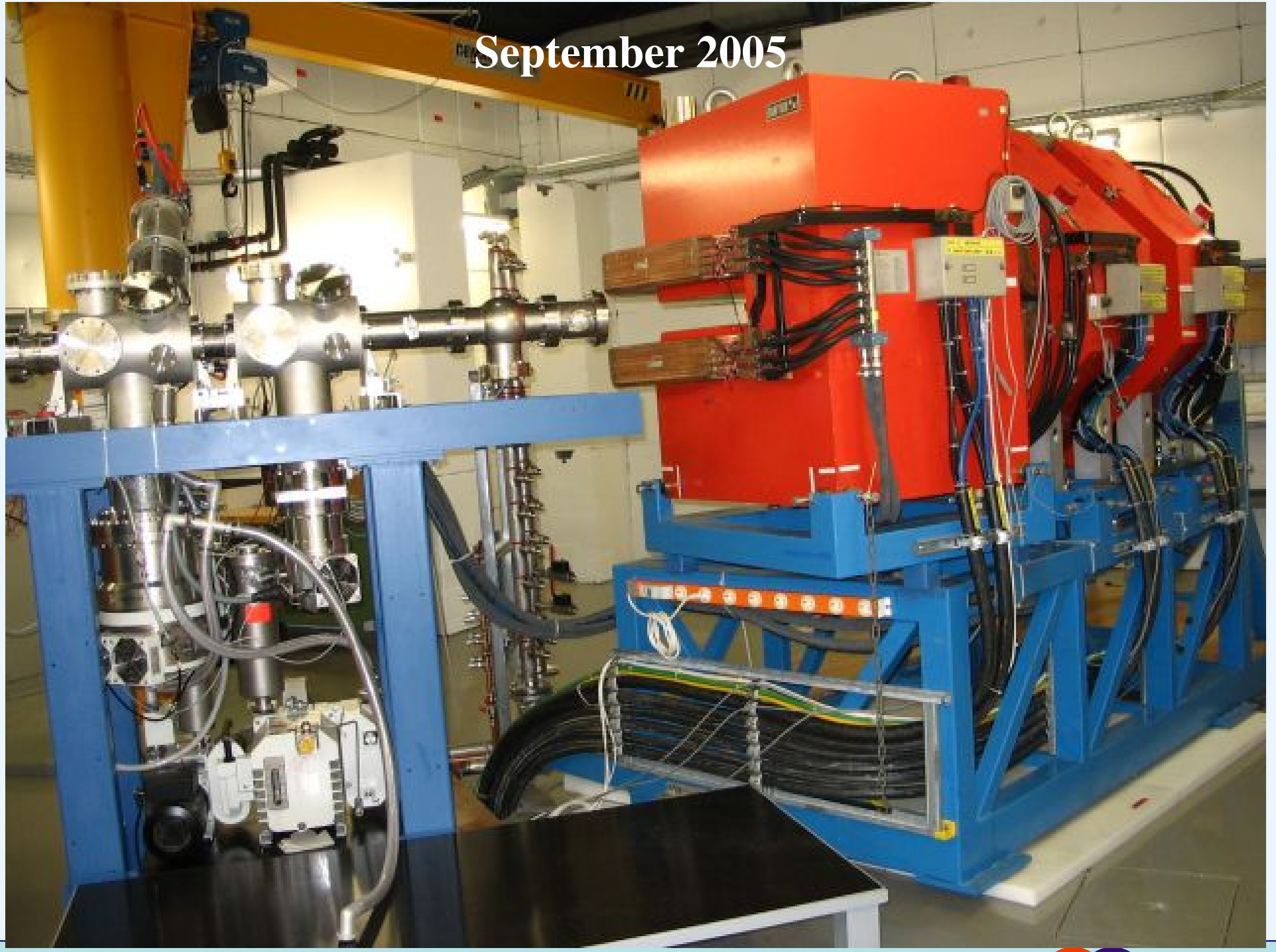
  - 2nd generation detector set-up under discussion

* *Focal plane – RTC* ("D 2."): under discussion – *critical, may cause delays (?)*

X8

TASCA


wobbler
beam diagnosis
target position
vacuum chambers
(size, flanches, ...)
D + QQ
differential
pumping
window
(optional)
valves
Q
Q
D
valve
Dipole, 30⁰
RTC +
Chem


September 2005

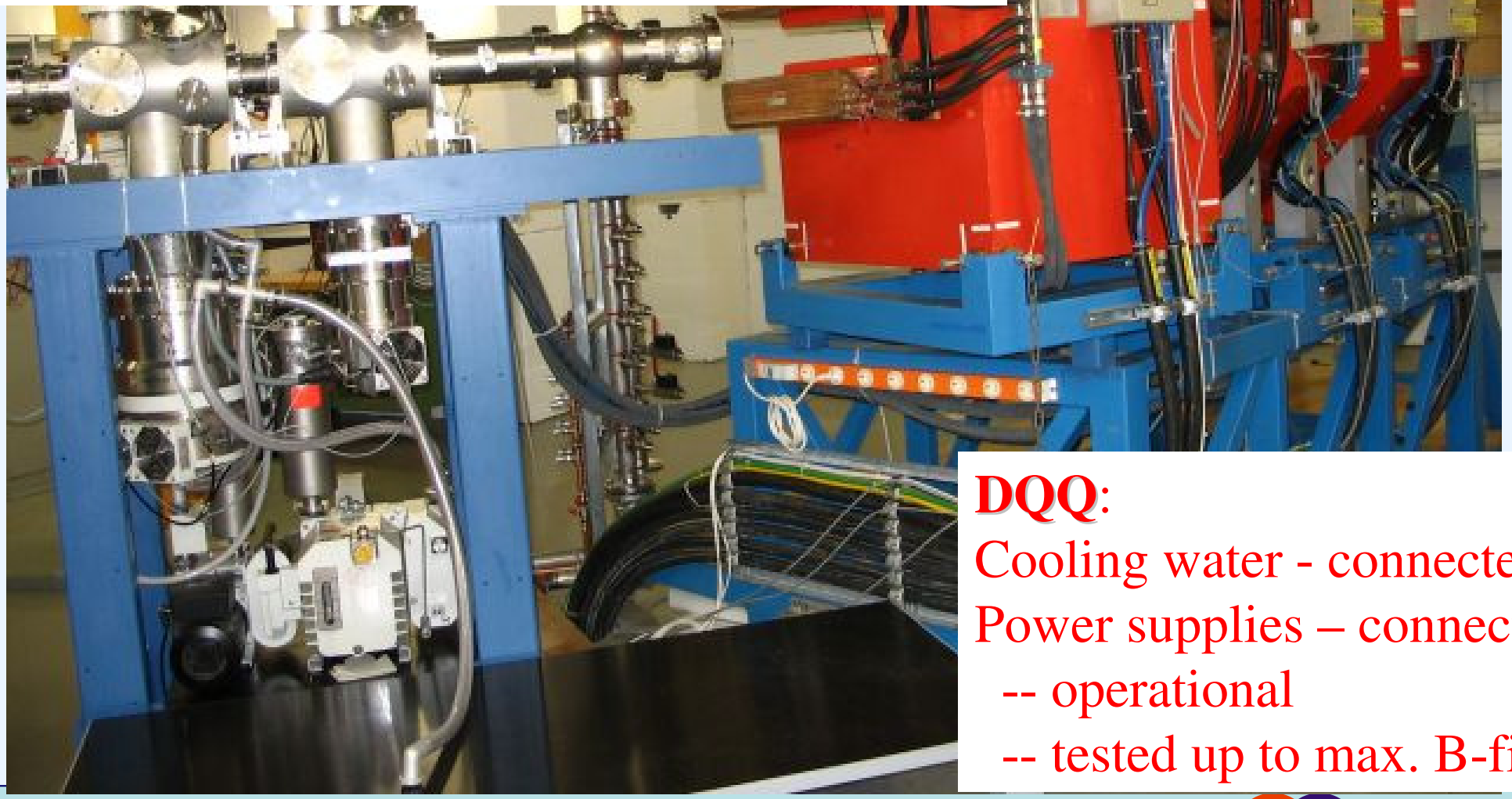
Window-less Operation – Differential Pumping:

WOT 400 / DBP 50 - replace ?

TMU 400 / DUO 35 - ok

TMU 1600 / DUO 20 – ok

tested➔ working; room for improvement



DQQ:

Cooling water - connected

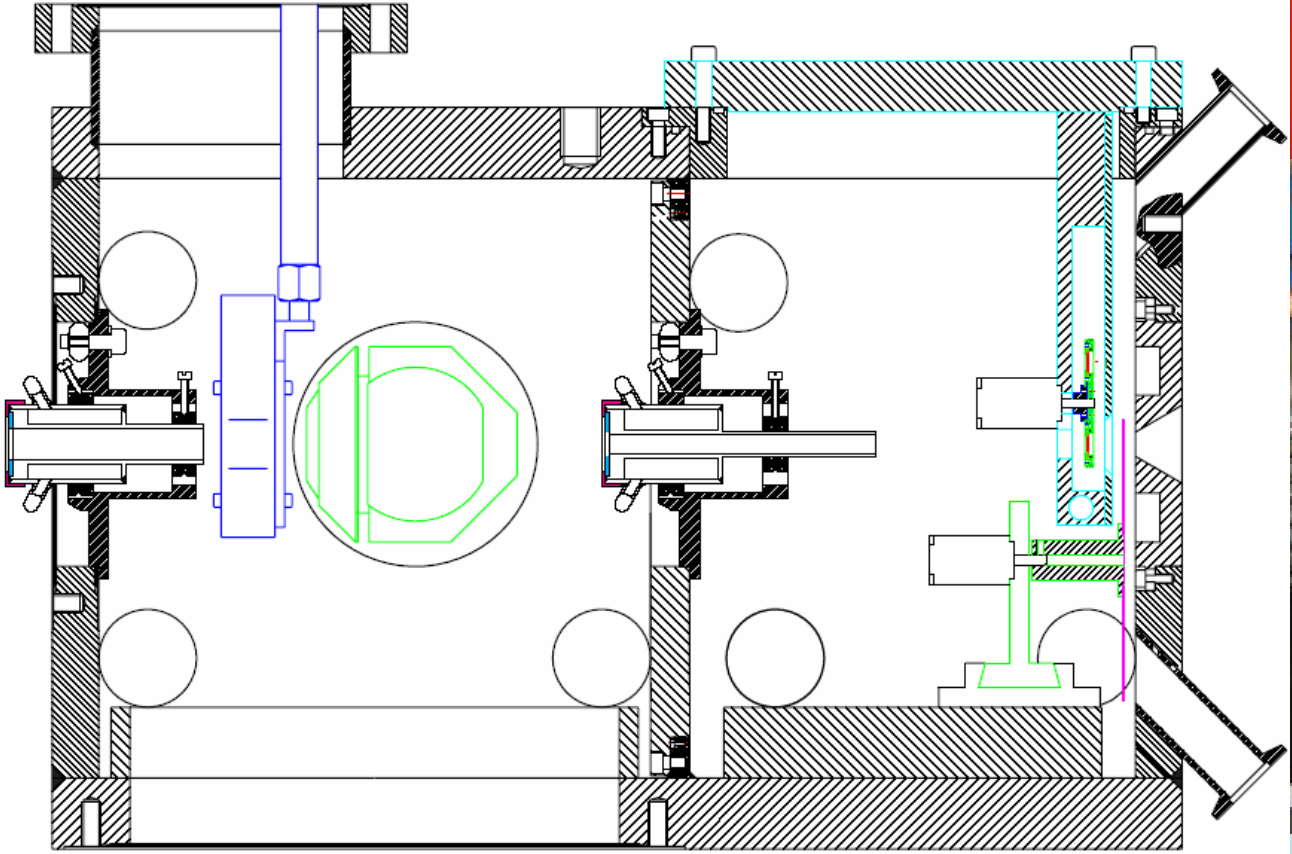
Power supplies – connected

-- operational

-- tested up to max. B-field

Target Chamber

October 2005 –side view



DQQ Vacuum Chambers

October 2005

TASCA

TASCA - DQ_hQ_v - configuration

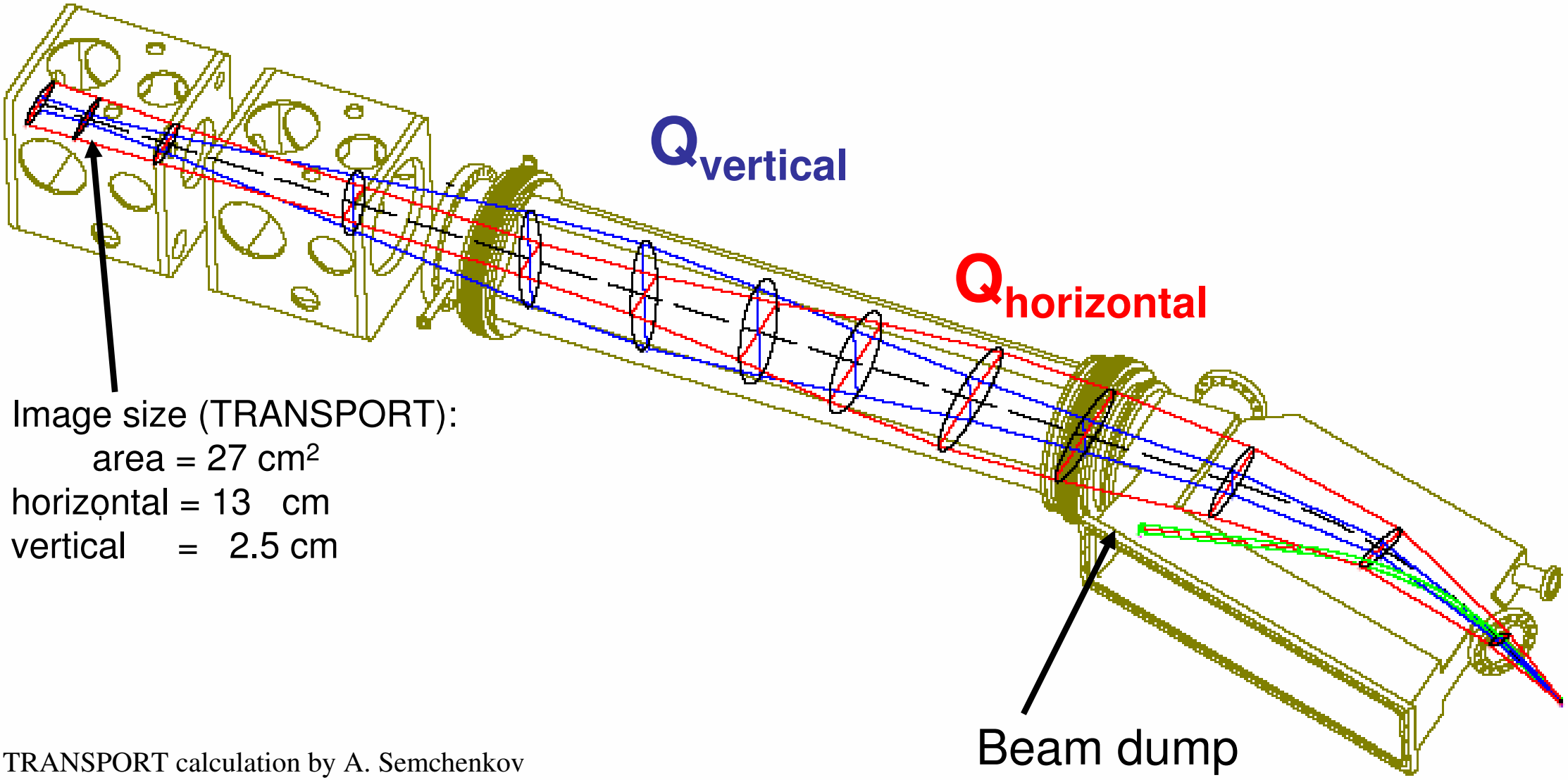


Image size (TRANSPORT):
area = 27 cm²
horizontal = 13 cm
vertical = 2.5 cm

TRANSPORT calculation by A. Semchenkov

TASCA - DQ_vQ_h - configuration

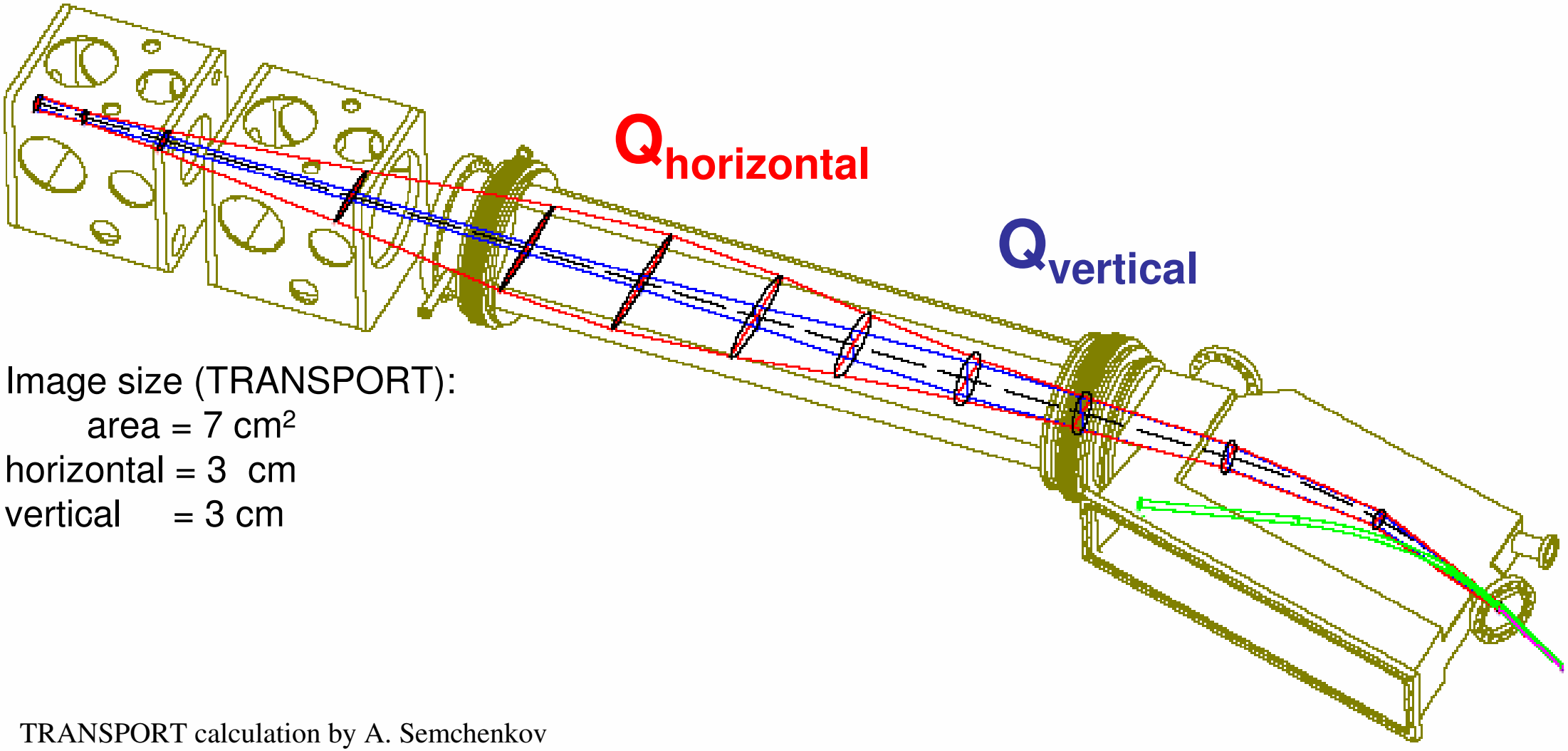


Image size (TRANSPORT):
area = 7 cm²
horizontal = 3 cm
vertical = 3 cm

TRANSPORT calculation by A. Semchenkov

Envisaged Next Steps

* Cave completed: end of 2005

* Beam line, target and vacuum chamber completed: end of 2005

* Test of magnets and power supplies completed: end of 2005

* Commissioning of beam line and diagnostics completed: mid of 2006

* 1st generation focal plane detector installed : mid of 2006 (?)

* Commissioning of the separator w/ beam: 2006 – 2007

* 1st generation "nuclear" experiments : 2007 - 2008

* RTC completed: 2007 (?)

* 1st generation "chemical" experiments: 2007 - 2008