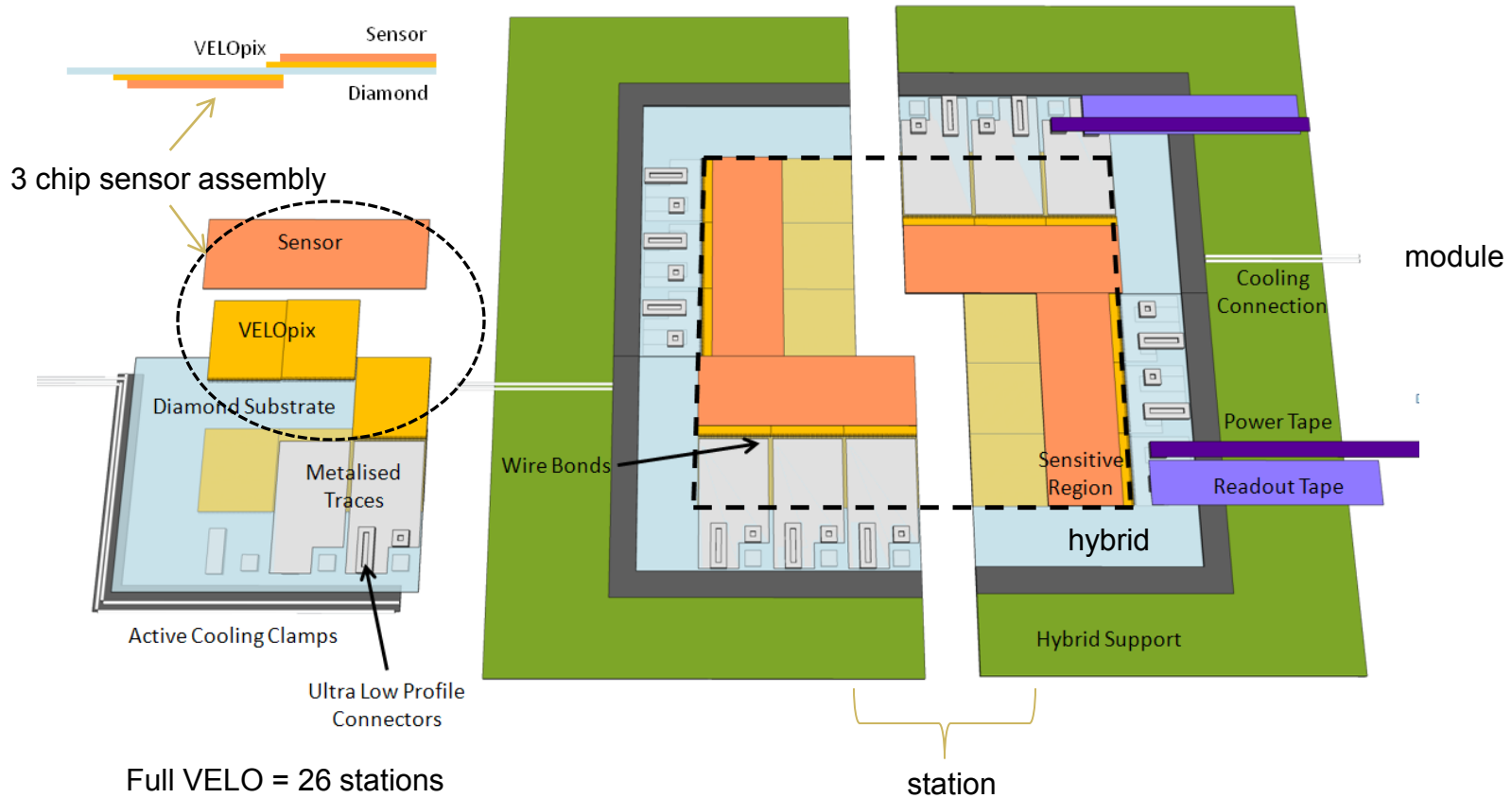


Powering of VELOpix modules: preliminary ideas/challenge.

Jan Buytaert

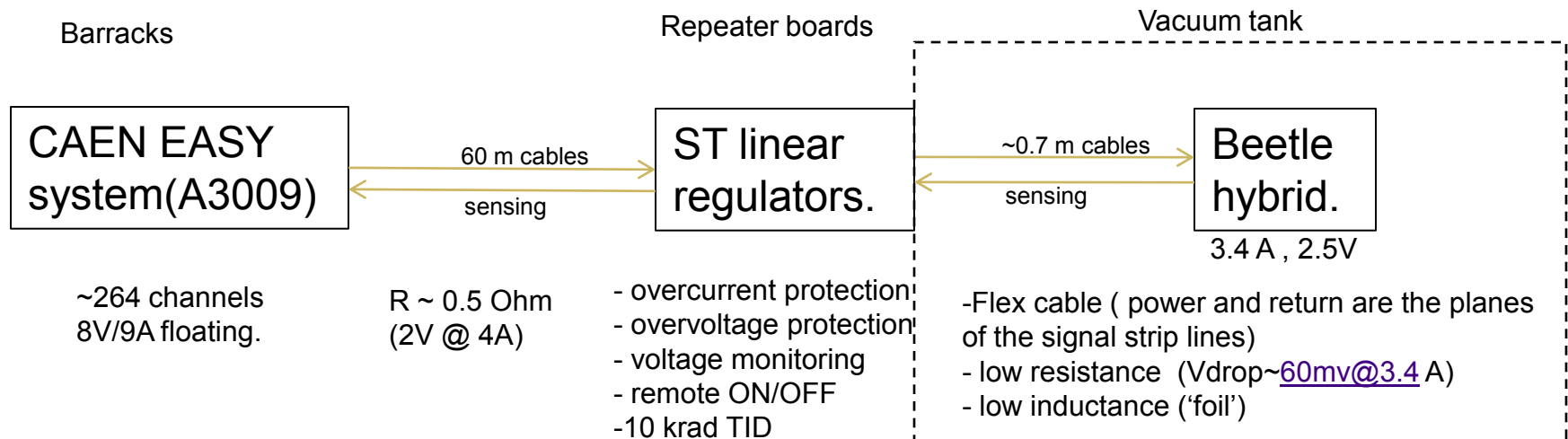
Module layout reminder



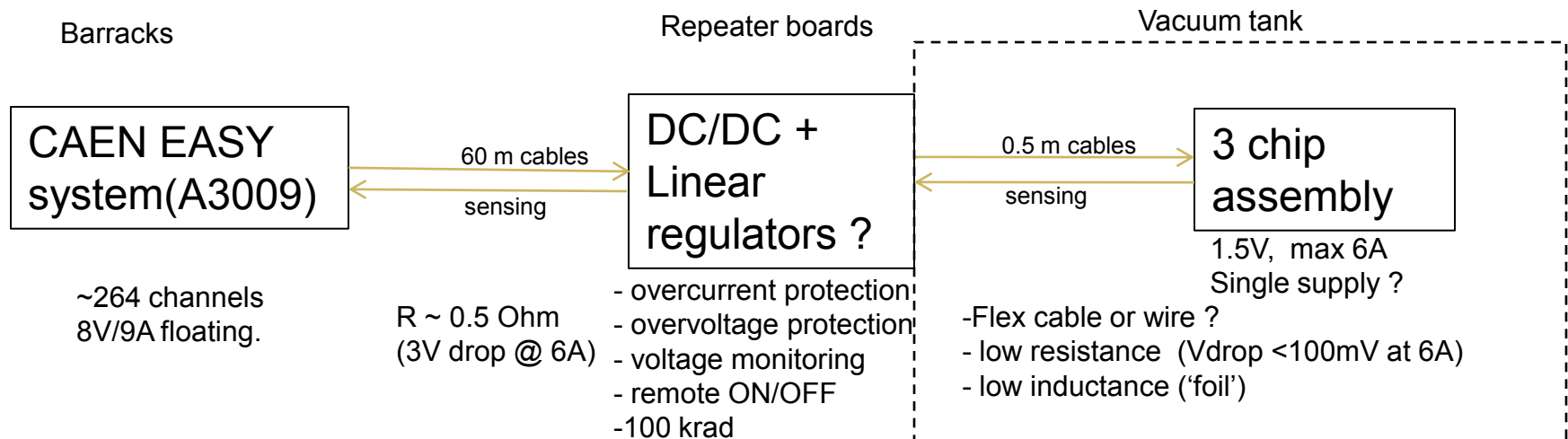
Full VELO = 26 stations
 1 station = 2 modules
 1 module = 2 hybrids
 1 hybrid = 2 '3 chip assemblies'

« 3 chip assemblies » :
 Total 208 units.
 'Natural' granularity of powering

Current Velo power system:



Upgrade Velo power system:



-DC/DC converters on repeater boards :

-Lower current/ Higher Voltage (but 8V limit of A3009 ! -> maximal current gain : 3)

->Less voltage drop in cables (x3) : ~1V

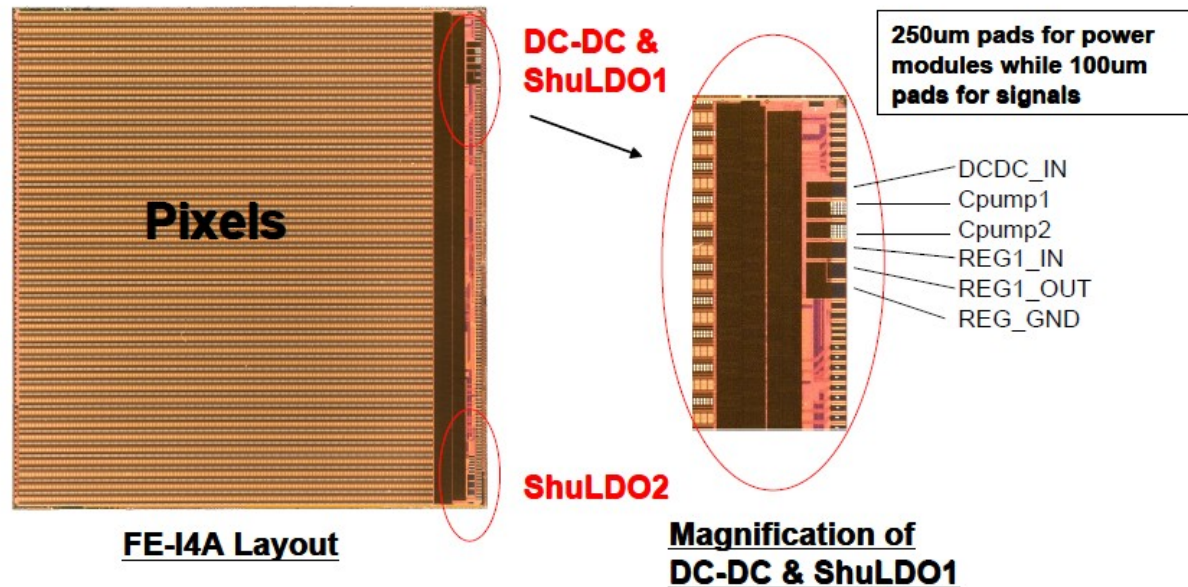
-6 A, rad tolerant linear regulators ? Could have 1 regulator per VELOpix (max 2A).

-Cables in vacuum need a copper crosssection of 1mm^2 to have 100mV drop over 1m at a current of 6A:

- wire of 1.1 mm diameter

- or Cu-foil of 36 um x 27 mm

Power Modules in FE-I4 Layout



- See <https://indico.cern.ch/getFile.py/access?contribId=5&resId=0&materialId=slides&confId=127662>
- But lower supply current (~700mA)
- power efficiency is ~20%. Aggravates cooling problem....
- noise injected in pixel ! May be corrected...
- follow up ...