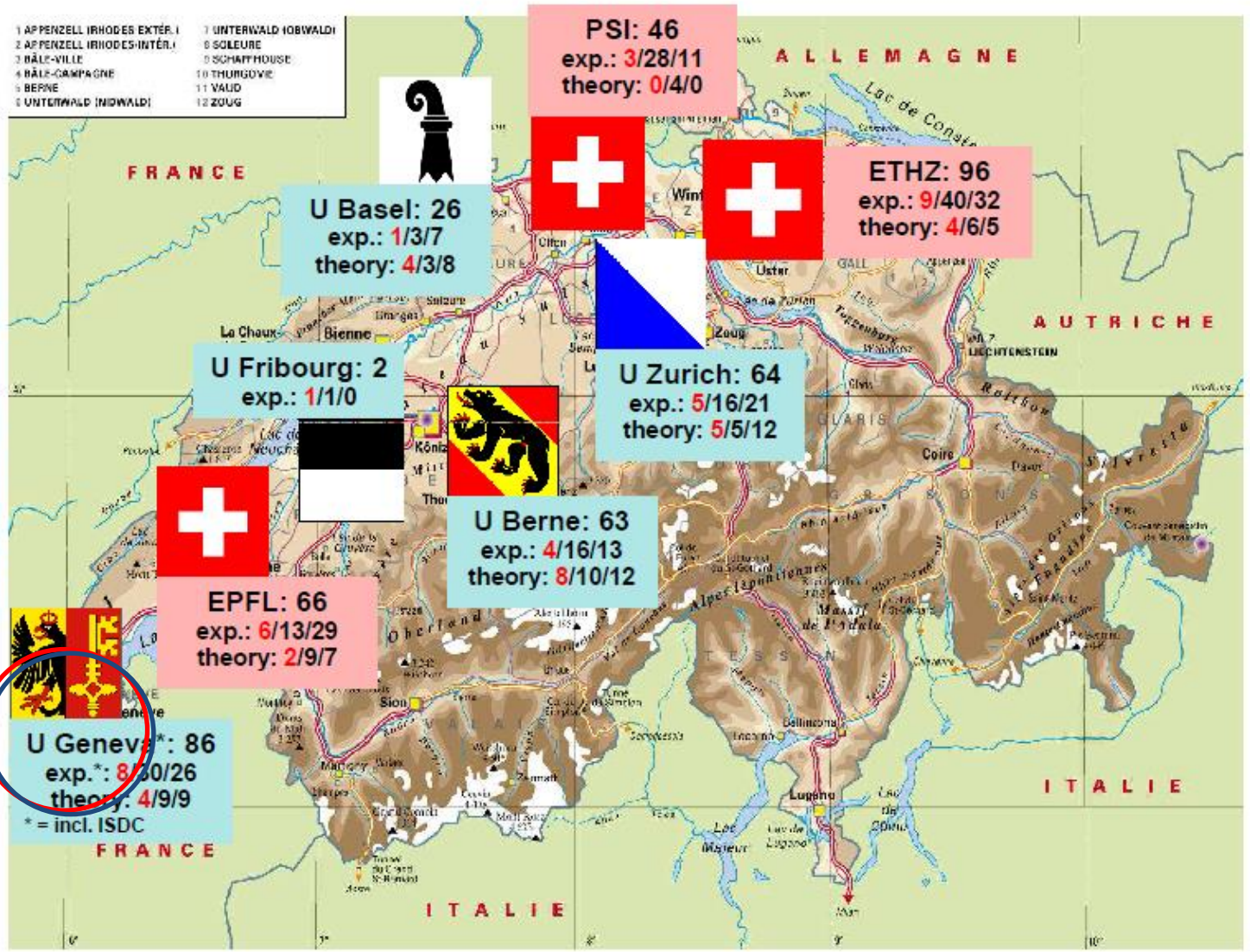
Swiss Particle Physics Landscape in 2013

Swiss Institute of Particle Physics

an Association according to Swiss law

sc | nat

Member of the Swiss Academy of Sciences



Total Scientific personnel:
Total 449

Professors / staff / PhD students
Total 64/193/192

(admin. & technical staff not included: hard to quantify)

FCCs

Source: CHIPP Membership Database, 11 Mar 2013
Author: J.P. Ruder

SWISS contributions to FCC-ee

-- Universities of Basel, Geneva, Zurich, + EPFL

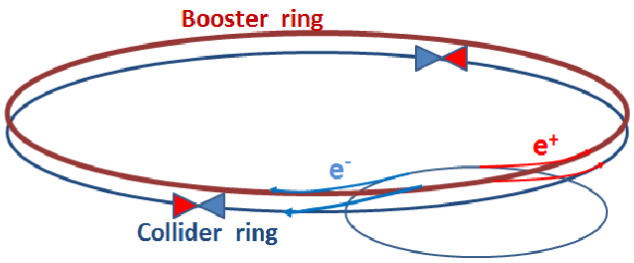
Accelerator contributions

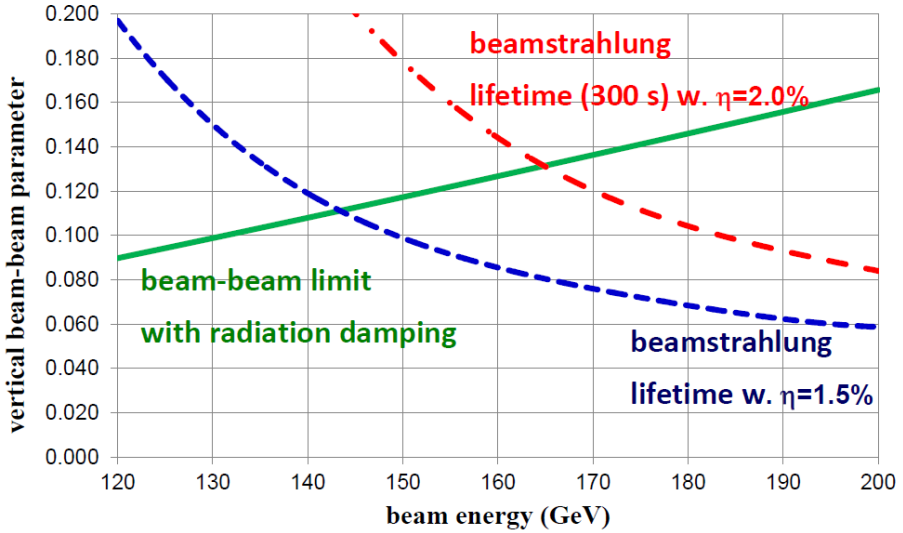
-- LEP3/TLEP/FCC-ee design work

-- 2 years FTE in joint appointment UNIGE-CERN (Koratzinos)

➔ beam life time in interplay between beamstrahlung and beam-beam blow-up

➔ possible operational use of polarization wigglers





ε_y = 2 pm,
β_y* = 1 mm

M. Koratzinos, A. Bogomyagkov, E. Levichev, D. Shatilov, K. Yokoya, V. Telnov, K. Oide, ...

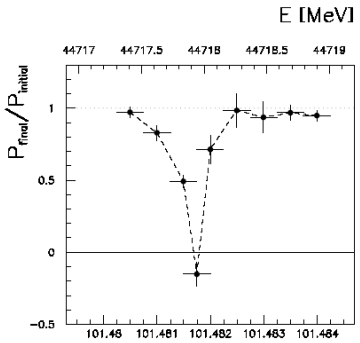
In the pipe-line:

-- Two positions requested at UNIGE to participate in beam polarisation and energy calibration (experience from LEP)
(Joint FCC request with PSI/EPFL)

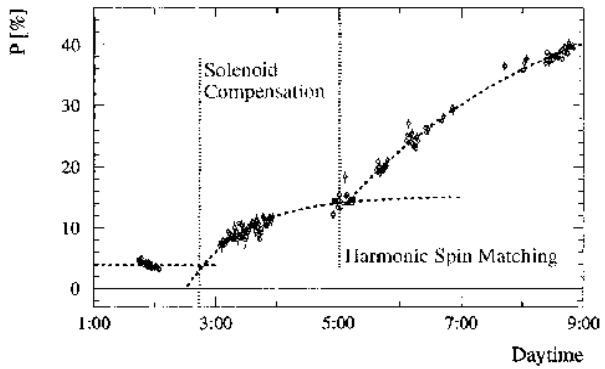
requested: 1 PhD + 1 post-doc for three years

1. implement/analyse spin simulation tools
2. simulate energy calibration and study systematic errors
3. study spin correctors methods
   - effect of possible ground kinks
   - effect of beam crossing at an angle
   - spin matching of exp. solenoids and polarization wigglers

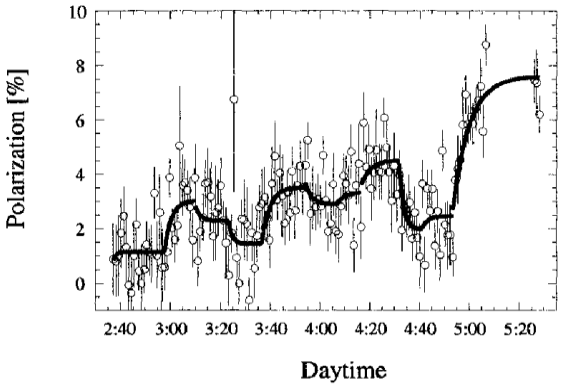
   within FCC collaboration (BINP, CERN, SLAC, etc..)
4. reproduce LEP status and try to improve with better computing power and alignment
   benefit from on-going experiments at BINP



energy calibration $^{\nu}$

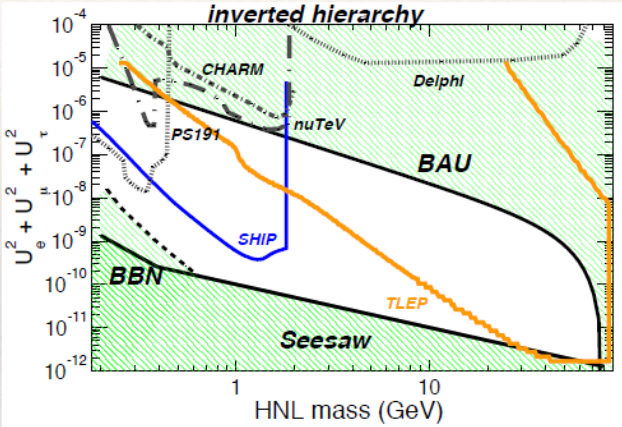


solenoid and orbit deterministic spin-matching



semi-empirical spin-matching

Physics studies



1. In the framework of a Swiss neutrino network:
   Basel (Prof. Antusch) , EPFL (Prof. Shaposnikov),
   Geneva (AB) + Uni Zurich (Prof. Serra)
   Direct and indirect effects of sterile neutrinos

2. Under discussion: funding request for physics&detector studies at FCC
   Interest in ATLAS and CMS groups across Switzerland

3. Contributions to software/analysis project:
   -- part of FTE (=<50%) from Geneva
   -- UniZurich (Prof. Serra) has applied for SNF starting grant (ERC equiv.) mainly on sterile neutrinos search -- if successful would contribute 50% of 1PhD + 1 Post-doc equivalent to software and developping analysis in collaboration with CERN.