


 FCC, Cern


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- ❖ Impatto sui servizi
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 CEPC, China



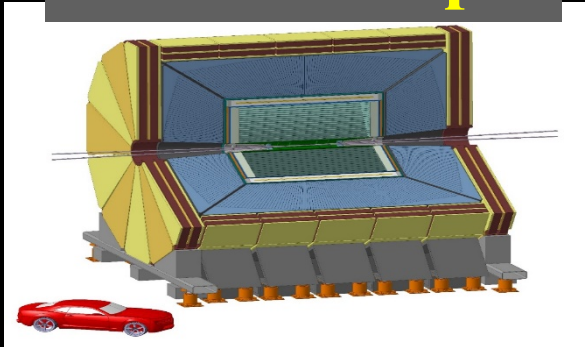
Quadro generale

<http://europeanstrategyupdate.web.cern.ch/>

2020 update of the European Strategy for Particle Physics

- ❖ «An electron-positron Higgs factory is the highest-priority facility after the LHC.. a feasibility study should be established and completed on the timescale of the next Strategy update.»

IDEA concept



❖ INFN ben rappresentata nelle strutture di controllo di FCC (e CEPC)

Steering groups, conveners di gruppi di lavoro, comitati scientifici di workshops internazionali

Calls EU: (ATTRACT terminata), CREMLIN+, FEST, AIDAinnova

Calls INFN: CC3M, (CSN5 da approvare)

❖ Detector concept proposto da personale INFN, IDEA, incluso nei CDR di FCC e CEPC.

- Studi software per ottimizzazione e benchmarking
- R&D su nuove tecnologie per vertex detectors, grandi camere a drift, solenoidi ultrasottili, calorimetria dual readout e cristalli, camere mu basate su μ Rwell, Trigger/DAQ

A Pisa partecipazione FEST, (CSN5), AIDAinnova e call CC3M 2020: “PhysicsInvolvingPeople”

- In corso: simulazioni, preparazione per prototipi calorimetro
- Possibili estensioni: MDI, vertex/large silicon, drift chamber, Trigger/DAQ

Anagrafica 2022

Nome	2021	2022	
➤ Annovi Alberto		10	
➤ Azzurri Paolo	10	30	EWK/Higgs physics
➤ Basti Andrea	10	10	Dual Readout
➤ Bedeschi Franco	20	25	Dual Readout
➤ Bianchini Lorenzo		5	EWK Physics
➤ Bosi Filippo	0	0	Silicon Detectors
➤ Cavasinni Vincenzo	0	0	Dual Readout
➤ Cervelli Franco	0	0	MDI
➤ Chiarelli Giorgio		10	EWK Physics
➤ Ciocci Agnese	10	10	Silicon Detectors
➤ Contino Roberto		10	TH – physics program
➤ Francavilla Paolo		10	EWK/Higgs physics
➤ Leone Sandra		10	EWK Physics
➤ Ligabue Franco		10	EWK Physics
➤ Messineo Alberto	10	10	Silicon Detectors
➤ Palla Fabrizio	5	5	Silicon Detectors
➤ Punzi Giovanni	10	10	Trigger/DAQ
➤ Roda Maria Chiara	10	10	Dual Readout
➤ Rolandi Luigi		15	EWK Physics
➤ Scuri Fabrizio		10	Dual Readout
➤ Spagnolo Paolo		5	EWK Physics
➤ Tenchini Roberto	10	10	EWK Physics
➤ Tonelli Guido	0	0	EWK Physics
➤ Trincerini Enrico		10	TH – physics program
➤ Verducci Monica	20	20	EWK Physics
➤ TOTALI:	115	245	

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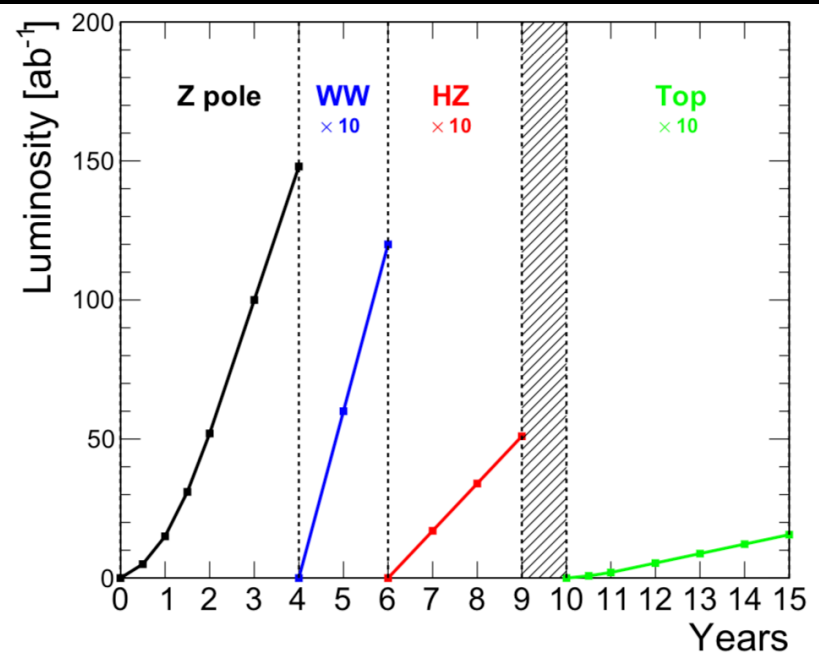
Richieste servizi sezione

❖ Minimo supporto ingegneri meccanici per R&D

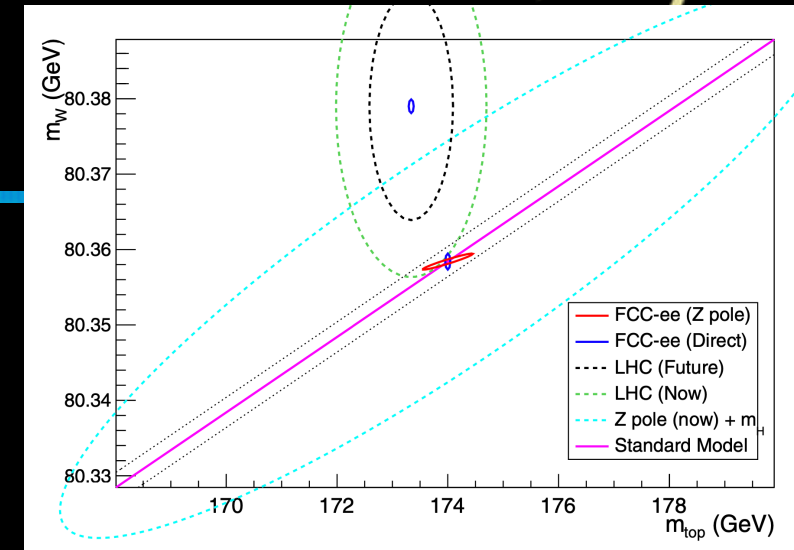
- μ -cooling silicio → Bosi (anche AIDAinnova)
- Meccanica IDEA → 10% Basti (20% se passa call CSN5)

Backup : FCCee physics program

<http://cern.ch/fcc>

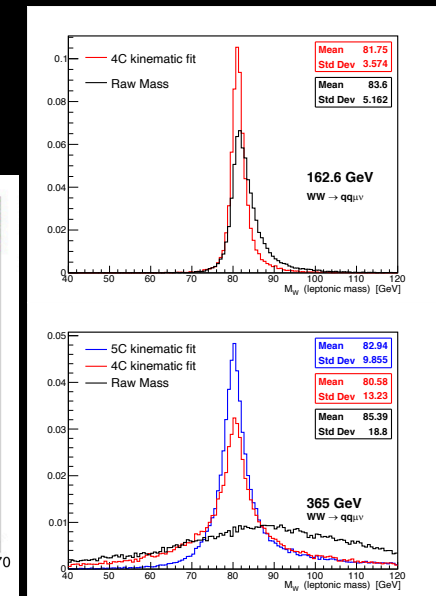
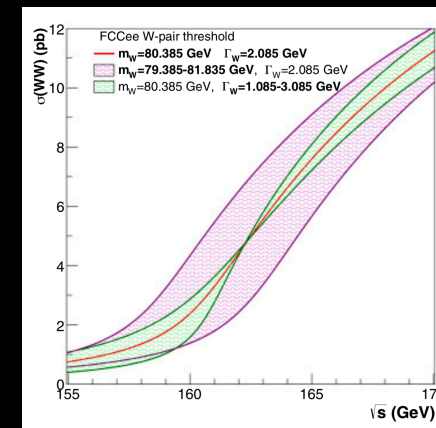
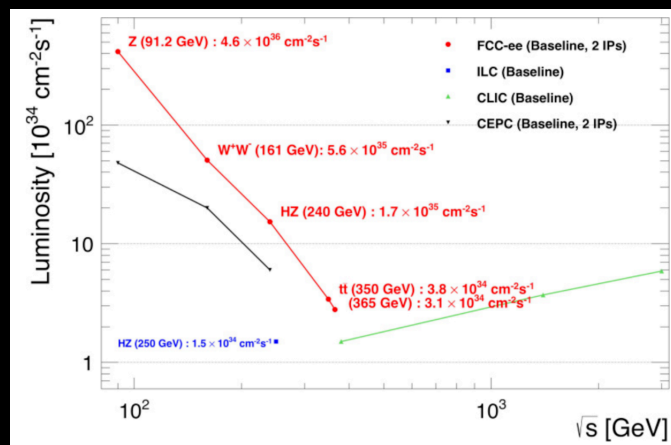


Observable	Present value ± error	FCC-ee stat.	FCC-ee syst.	Comment and dominant exp. error
m_Z (keV/c ²)	91,186,700 ± 2200	5	100	From Z line shape scan Beam energy calibration
Γ_Z (keV)	2,495,200 ± 2300	8	100	From Z line shape scan beam energy calibration
R_Z^e ($\times 10^3$)	20,767 ± 25	0.06	0.2-1	Ratio of hadrons to leptons acceptance for leptons
α_s (m_Z) ($\times 10^4$)	1196 ± 30	0.1	0.4-1.6	From R_Z^e above
R_b ($\times 10^6$)	216,290 ± 660	0.3	< 60	Ratio of $b\bar{b}$ to hadrons stat. extrapol. from SLD
σ_{had}^0 ($\times 10^3$) (nb)	41,541 ± 37	0.1	4	Peak hadronic cross-section luminosity measurement
N_c ($\times 10^3$)	2991 ± 7	0.005	1	Z peak cross sections Luminosity measurement
$\sin^2\theta_{eff}^e$ ($\times 10^6$)	231,480 ± 160	3	2-5	From $A_{FB}^{0,\tau}$ at Z peak Beam energy calibration
$1/\alpha_{QED}$ (m_Z) ($\times 10^3$)	128,952 ± 14	4	Small	From $A_{FB}^{0,\tau}$ off peak
$A_{FB}^{b,0}$ ($\times 10^4$)	992 ± 16	0.02	1-3	b-quark asymmetry at Z pole from jet charge
$A_{FB}^{\tau,\tau}$ ($\times 10^4$)	1498 ± 49	0.15	< 2	τ Polarisation and charge asymmetry τ decay physics
m_W (MeV/c ²)	80,350 ± 15	0.5	0.3	From WW threshold scan Beam energy calibration
Γ_W (MeV)	2085 ± 42	1.2	0.3	From WW threshold scan beam energy calibration
α_s (m_W) ($\times 10^4$)	1170 ± 420	3	Small	From R_Z^e
N_c ($\times 10^3$)	2920 ± 50	0.8	Small	Ratio of invis. to leptonic in radiative Z returns



PoS EPS-HEP2019 (2020) 653

Contributi recenti Pisa : m_W *Eur.Phys.J.C* 80 (2020) 1
 PoS ICHEP2020 (2021) 819



5 · 10¹² hadronic Z
 (10⁵ LEP1)

1.5 · 10⁸ W-pairs
 (0.5 · 10⁴ LEP2)

Backup : FCCee IDEA concept

“International Detector for Electron-positron Accelerators” (IDEA),

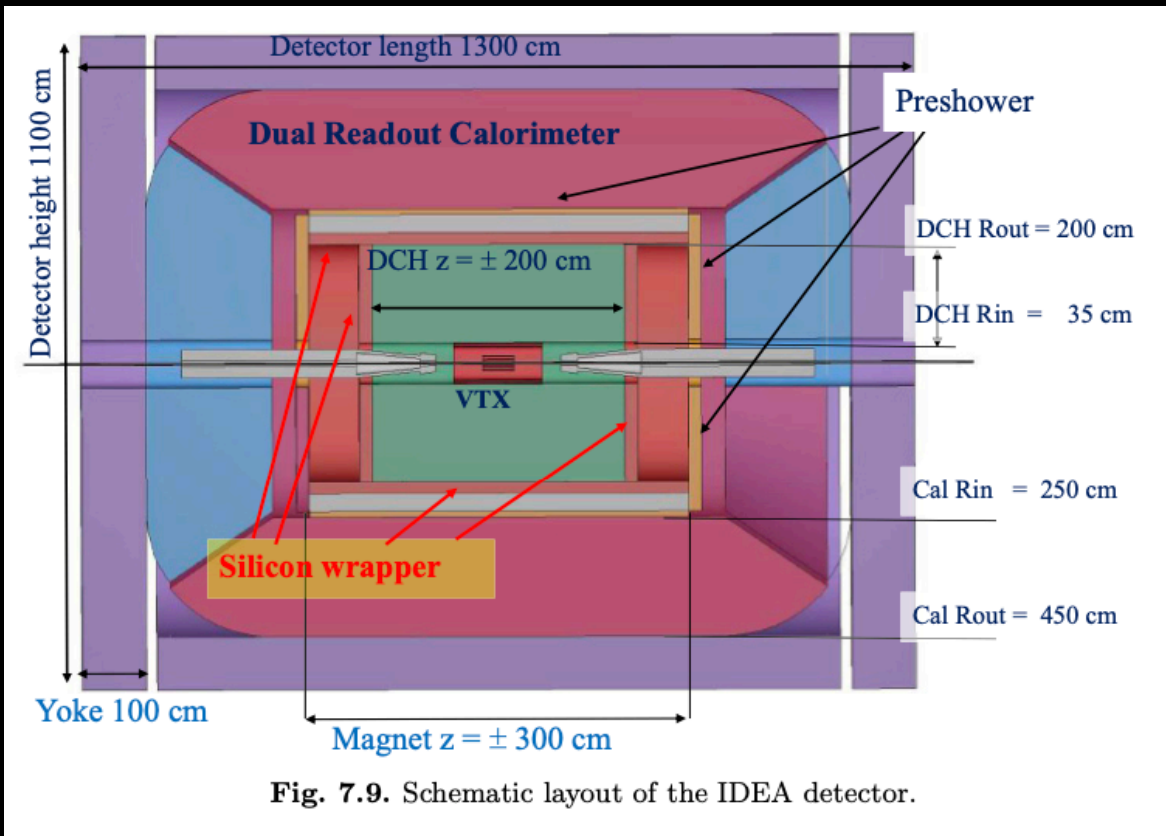


Fig. 7.9. Schematic layout of the IDEA detector.

- vertex detector
- drift chamber
- silicon wrapper
- preshower detector
- dual-readout calorimeter
- muon system