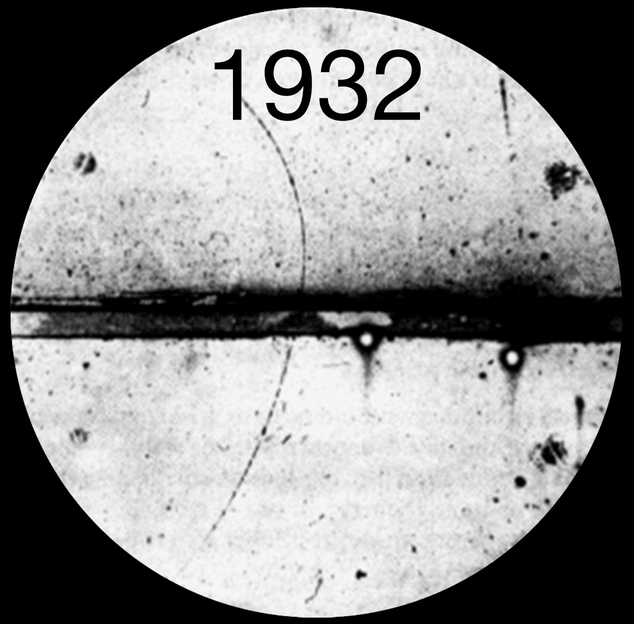
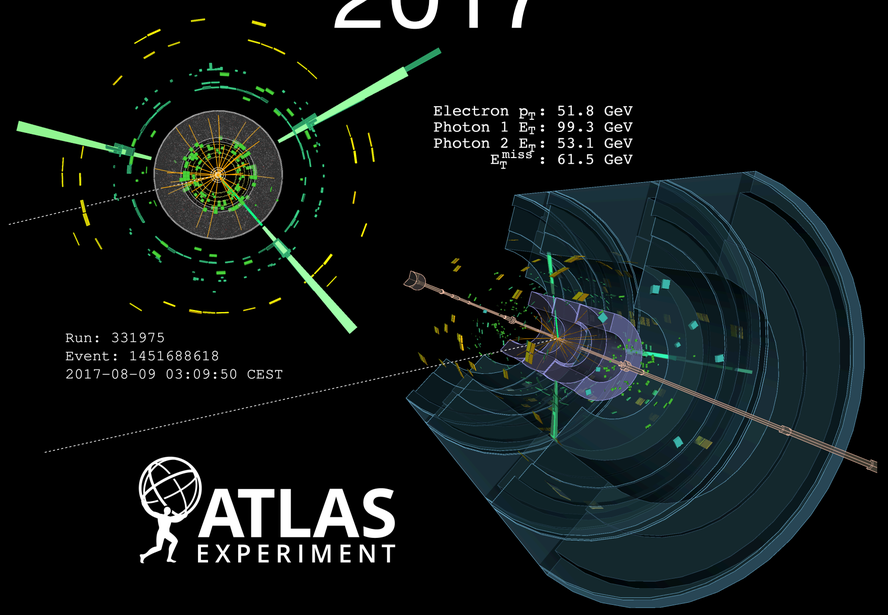
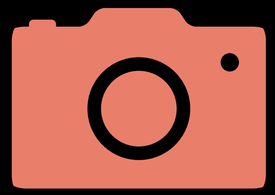
PHYS 7363 - Experimental Particle Detection and Detectors I



2017

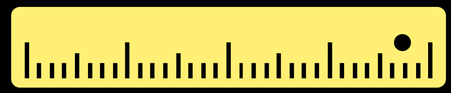


Particle detectors are the workhorses of experimental physics. In this course, we'll dive deep into their physics, exploring the incredible evolution of our experimental techniques over the past nine decades. You'll gain a solid understanding of *particle detection* and *identification*, examine the intricate designs of modern detectors, and learn how machine learning is being harnessed to push the boundaries of detector design. If you're intrigued by how we “see” subatomic particles, this course is for you!



Detect

Identify



Measure

To discuss prerequisites (and any questions on the content of the course), please contact me: saptaparnab@smu.edu

Schedule

Month	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
October	6 ✅ 1.5 hours	7	8 ✅ 1.5 hours	9	10	11	12
	13 ✅ 1.5 hours	14	15 1.5 hours	16	17 1.5 hours	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	1	2
November	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
December	1	2	3	4	5	6	7
	8	9	10	11	12	13	14

Paper Reading

Physics > Instrumentation and Detectors

[Submitted on 27 Nov 2019 (v1), last revised 12 Dec 2019 (this version, v3)]

CLD -- A Detector Concept for the FCC-ee

N. Bacchetta, J.-J. Blaising, E. Brondolin, M. Dam, D. Dannheim, K. Elsener, D. Hynds, P. Janot, A.M. Kolano, E. Leogrande, L. Linssen, A. Nürnberg, E.F. Perez, M. Petrič, P. Roloff, A. Sailer, N. Siegrist, O. Viazlo, G.G. Voutsinas, M.A. Weber

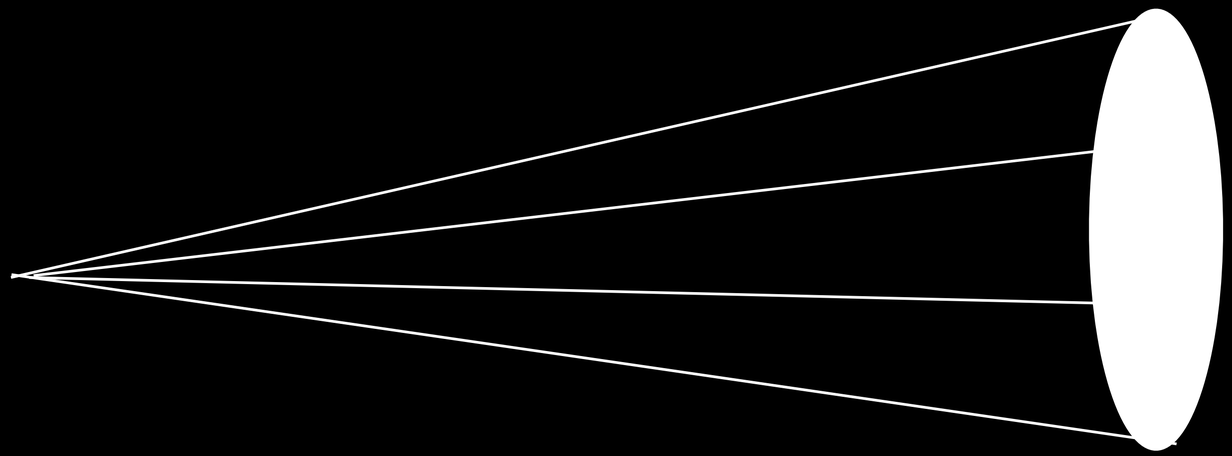
This note gives a conceptual description and illustration of the CLD detector, based on the work for a detector at CLIC. CLD is one of the detectors envisaged at a future 100 km e^+e^- circular collider (FCC-ee). The note also contains a brief description of the simulation and reconstruction tools used in the linear collider community, which have been adapted for physics and performance studies of CLD. The detector performance is described in terms of single particles, particles in jets, jet energy and angular resolution, and flavour tagging. The impact of beam-related backgrounds (incoherent e^+e^- pairs and synchrotron radiation photons) on the performance is also discussed.

Comments:	75 pages, 67 figures
Subjects:	**Instrumentation and Detectors (physics.ins-det)**; High Energy Physics - Experiment (hep-ex)
Report number:	LCD-Note-2019-001
Cite as:	arXiv:1911.12230 **[physics.ins-det]**
	(or arXiv:1911.12230v3 **[physics.ins-det]** for this version)
	https://doi.org/10.48550/arXiv.1911.12230

Submission history

From: Marko Petrič [view email]
[v1] Wed, 27 Nov 2019 15:42:47 UTC (5,032 KB)
[v2] Fri, 29 Nov 2019 10:21:57 UTC (5,032 KB)
[v3] Thu, 12 Dec 2019 16:06:12 UTC (5,597 KB)

One of the goals



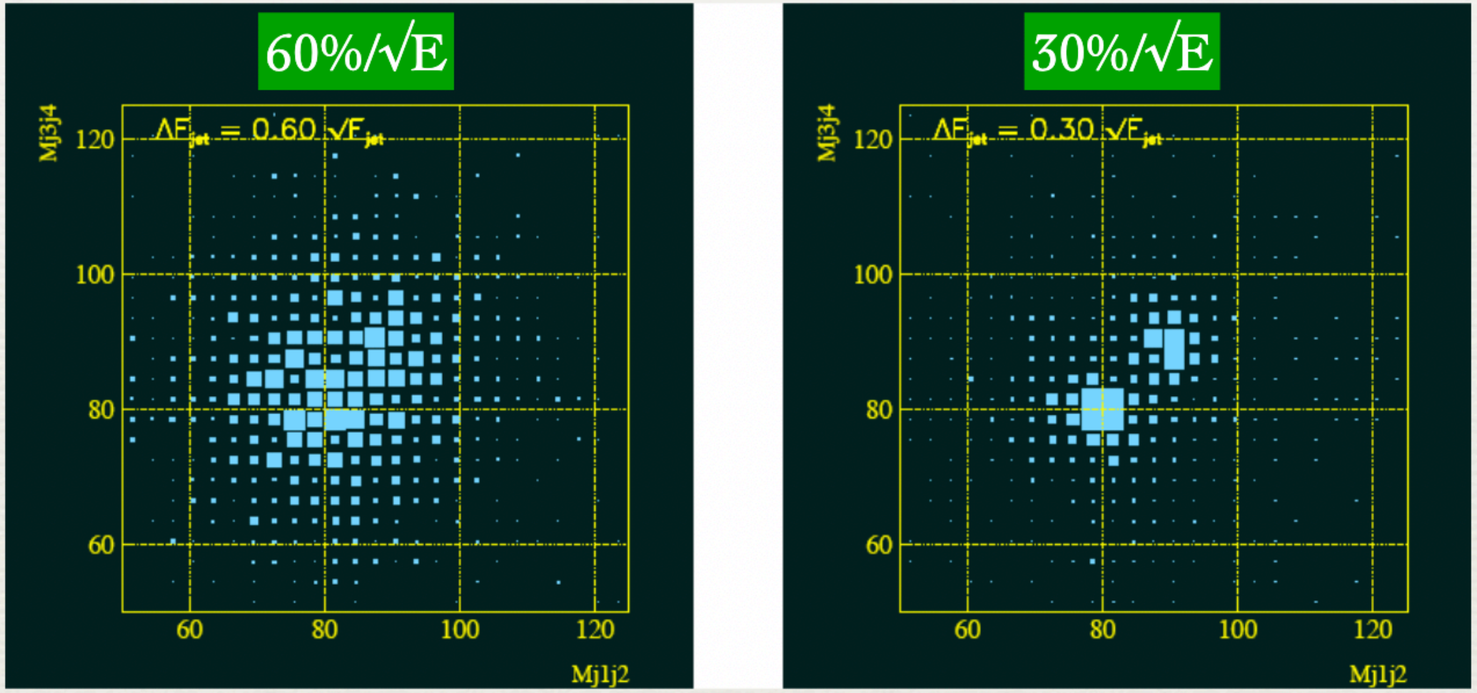
$Z \rightarrow$ jets

One of the goals

Design goal ILC: separate W, Z → $q\bar{q}$

LEP-like detector

ILC design goal



M_{jj}

M_{jj}