JADE resurrection

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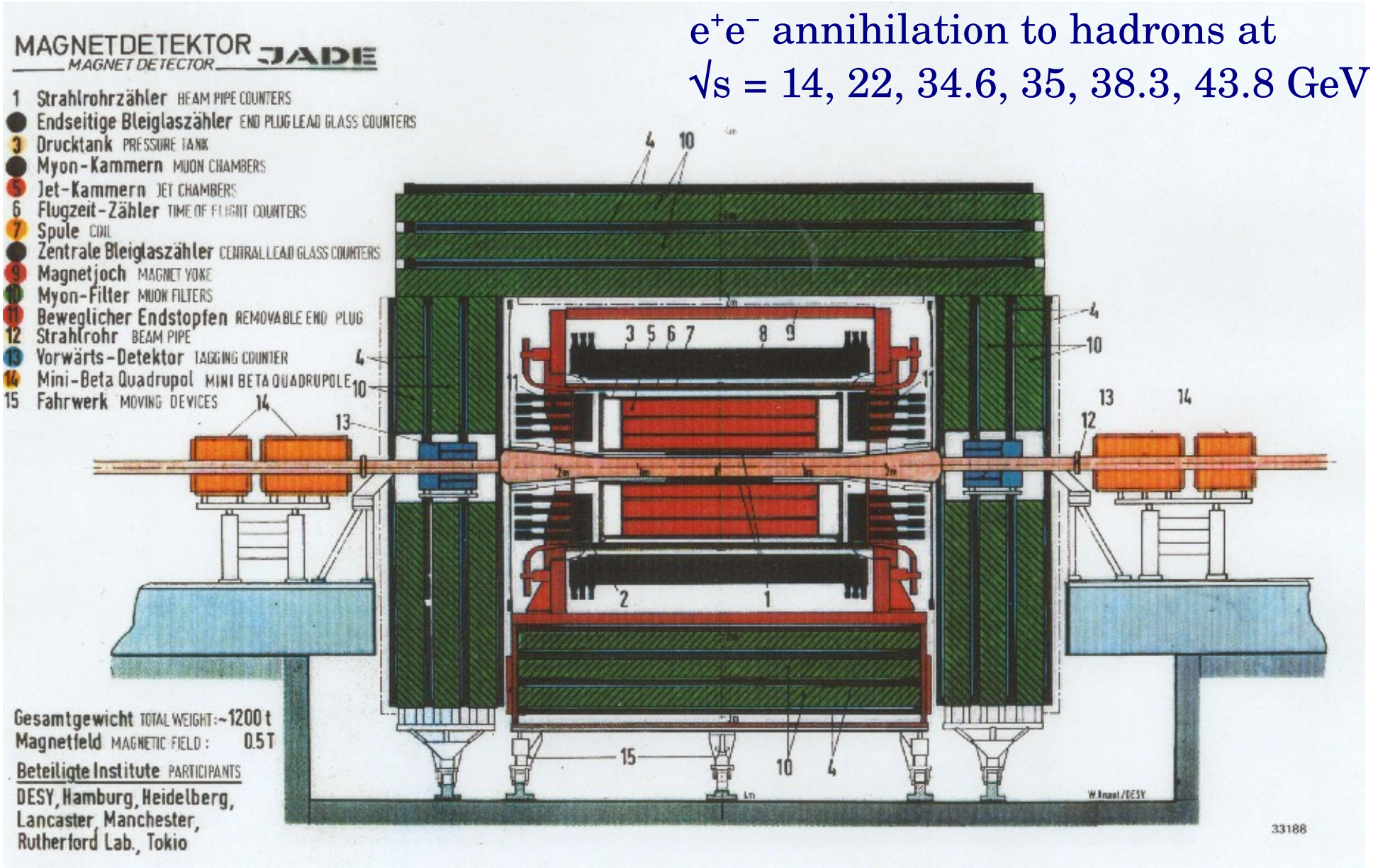
JADE experiment

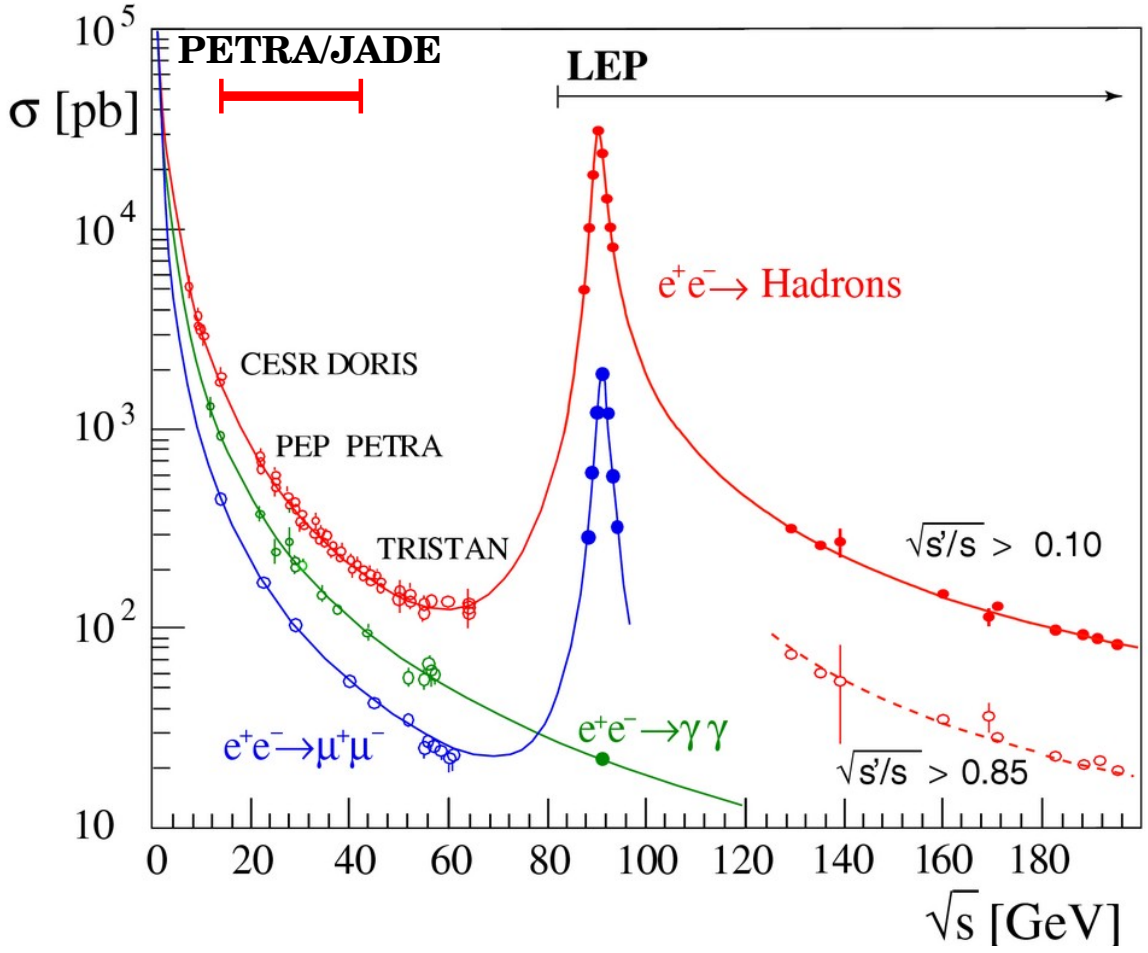
1979 to 1986 at PETRA (DESY)

e^+e^- annihilation to hadrons at

$\sqrt{s}$ = 14, 22, 34.6, 35, 38.3, 43.8 GeV



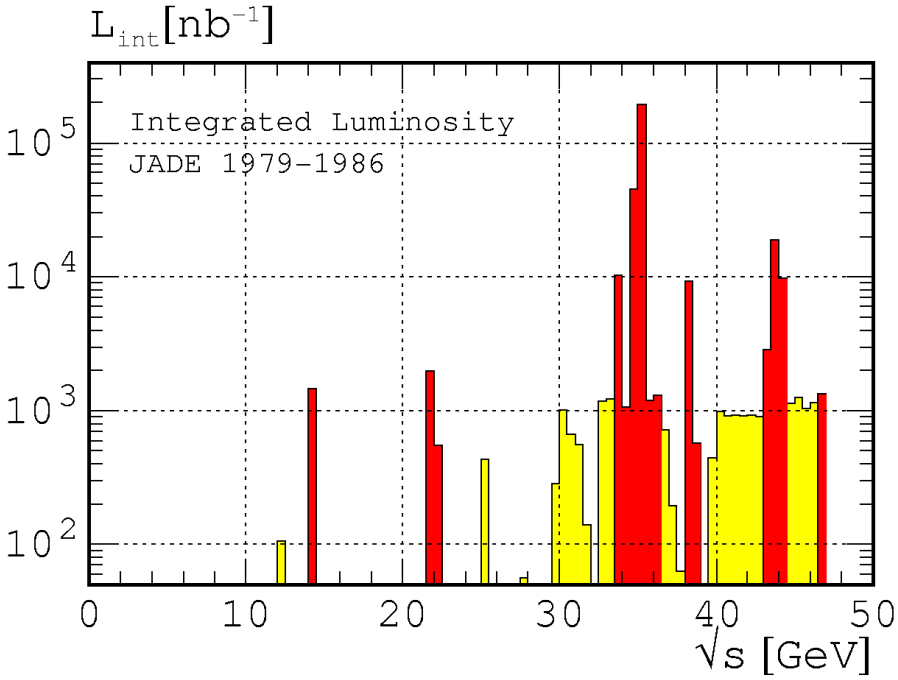
JADE data



Data samples:

$O(10^3\text{-}10^4)$ events

Negligible backgrounds after selection



Resurrection history

- Mid to late 90s:
  - S. Bethke and team collect JADE tapes which survived DESY clean-outs: data and software
  - First QCD analyses with “4-vector” files
  - Start port of software to IBM AIX platform
- Early 00s:
  - JADE software ported, missing libraries wrapped to CERNLIB, new MC generators verified
  - Common JADE and OPAL QCD ntuples
  - JADE analysis cited for 2004 physics Nobel prize

Resurrection history

- Mid 00s to today
  - Strong physics output, unique tests of QCD
  - Move from in-house AIX to Rechenzentrum Garching (RZG)
  - Copy data to RZG storage
- Today
  - IBM AIX platform fading away
  - Exabyte cartriges and DVD-RAM media?
  - Port JADE software to Linux? Virtual AIX? OPAL/JADE QCD ntuples only? New NLO and multileg-ME MCs?

Porting the software

- Status before the project
  - FORTRAN IV and 77 mix, SHELTRAN and MORTRAN preprocessors
  - Optimised for 70's and 80's mainfraimes
    - Minimize RAM usage and function calls
  - No version control, no build system, “the code is the comment”, 6-character variable names, …
  - No verification standards
  - Lost external libraries (DESYLIB)
  - Few lost simulation modules (live without)

Porting the software

- Choose IBM AIX on RS6000
  - Pure luck that DESY chose IBM mainframes
  - IBM XLF FORTRAN compiler supported on AIX
    - Incl. non-standard language (ab)use
- Choose CERNLIB as external library
  - Wrap calls to lost DESYLIB and graphics lib
  - Served us well for last 15 years
- Use CVS and GNU make
- About 1 year PostDoc + PhD
  - O. Biebel and P.A. Movilla-Fernandez
- Advice and help from ex-JADE software expert
  - Jan Olssen (DESY)

Costs

- Personnel
  - ca. 10 FTE·a until ~2005, ca. 2 FTE·a since
    - Total incl. physics analysis and maintainance
  - Travel ~10 k€/a
- Hardware
  - IBM RS6000 workstations: O(few 10 k€)
  - Storage: use RZG resources of MPP
- Total
  - 850 k€ personnel and travel, < 100 k€ hardware
  - Today total JADE resurrection < 1000 k€!

Cost comments

- Hardware and storage
  - Small fraction for old experiment (10%?)
- Personnel
  - Dominant (90%?)
  - Software work critical if new MC is essential
  - Combination with physics important

Future

- JADE software preservation
  - Needed for continued analysis work
  - Port to Linux (or learn virtual AIX?)
  - Requires dedicated work, i.e. FTEs
    - Hire retired experts, DPHEP postdoc
- Hardware and storage
  - Probably neglible
  - Usage fees in computing centre?
- Low effort to stay afloat, retain high visibility