



JADE resurrection

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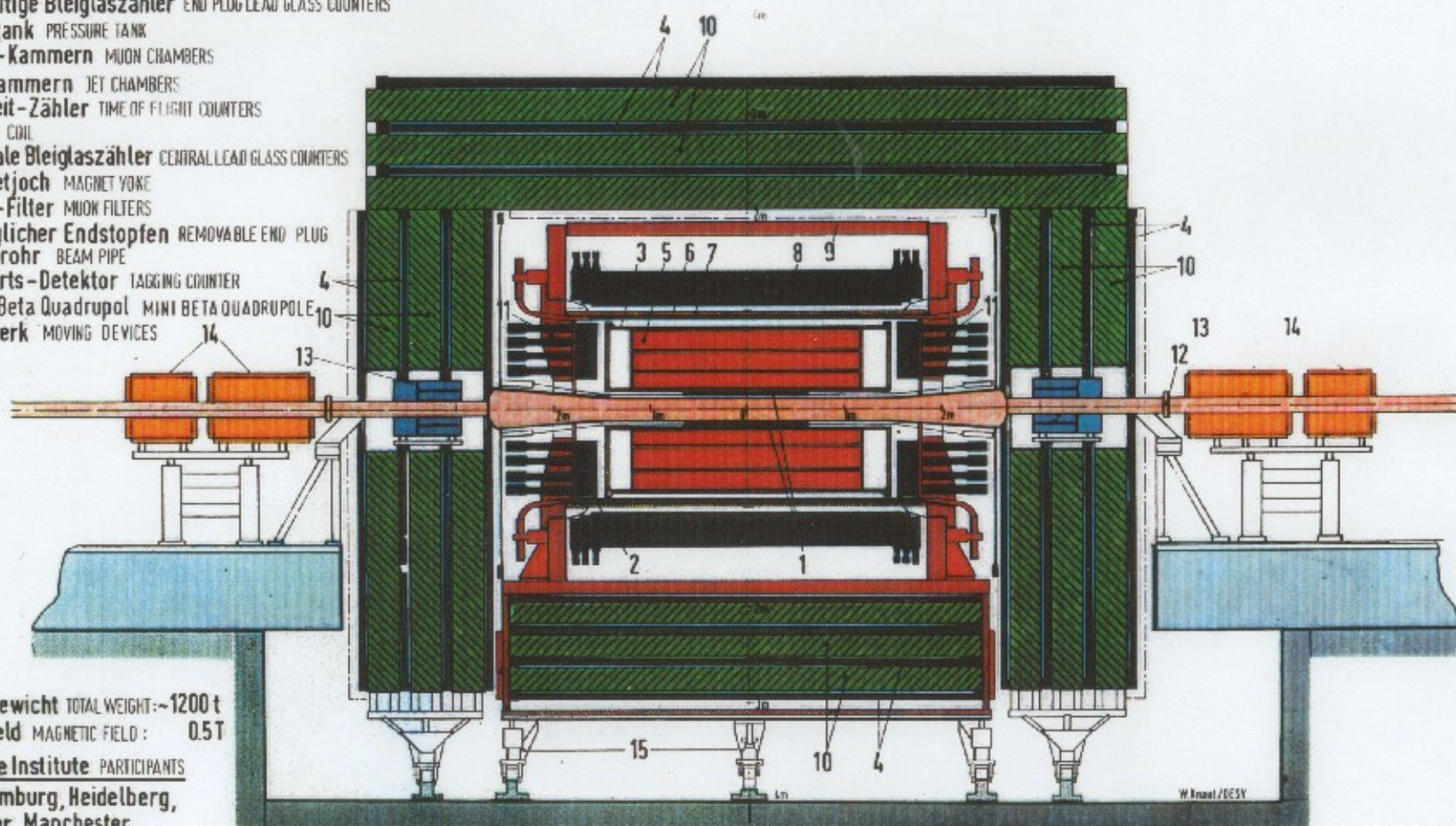
JADE experiment

JADE

1979 to 1986 at PETRA (DESY)
 e^+e^- annihilation to hadrons at
 $\sqrt{s} = 14, 22, 34.6, 35, 38.3, 43.8$ GeV

MAGNETDETEKTOR JADE MAGNET DETECTOR

- 1 Strahlrohrzähler BEAM PIPE COUNTERS
- 2 Endseitige Bleiglaszähler END PLUG LEAD GLASS COUNTERS
- 3 Drucktank PRESSURE TANK
- 4 Myon-Kammern MUON CHAMBERS
- 5 Jet-Kammern JET CHAMBERS
- 6 Flugzeit-Zähler TIME OF FLIGHT COUNTERS
- 7 Spule COIL
- 8 Zentrale Bleiglaszähler CENTRAL LEAD GLASS COUNTERS
- 9 Magnetjoch MAGNET YOKE
- 10 Myon-Filter MUON FILTERS
- 11 Beweglicher Endstopfen REMOVABLE END PLUG
- 12 Strahlrohr BEAM PIPE
- 13 Vorwärts-Detektor TAGGING COUNTER
- 14 Mini-Beta Quadrupol MINI BETA QUADRUPOLE
- 15 Fahrwerk MOVING DEVICES



Gesamtgewicht TOTAL WEIGHT: ~1200 t

Magnetfeld MAGNETIC FIELD: 0.5 T

Beteiligte Institute PARTICIPANTS

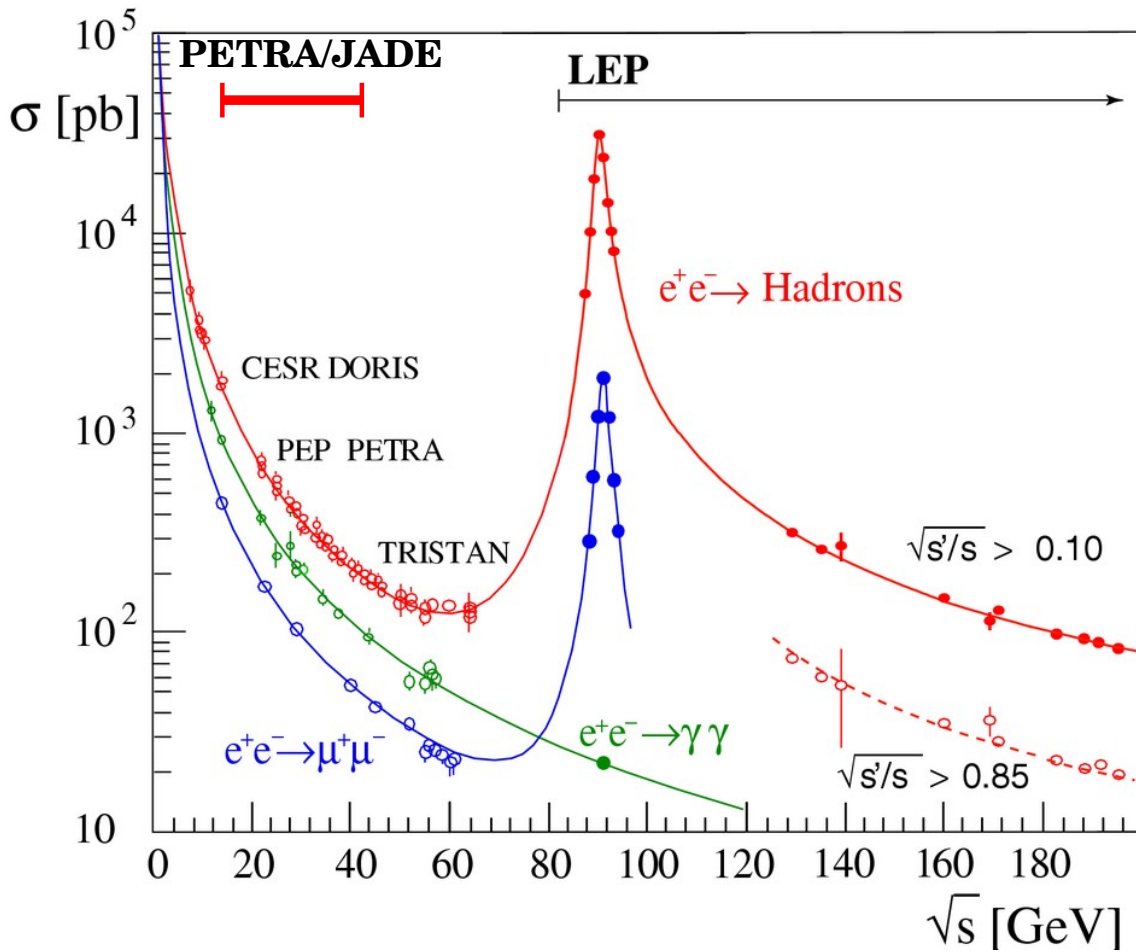
DESY, Hamburg, Heidelberg,
Lancaster, Manchester,
Rutherford Lab., Tokio

W Kraus / DESY

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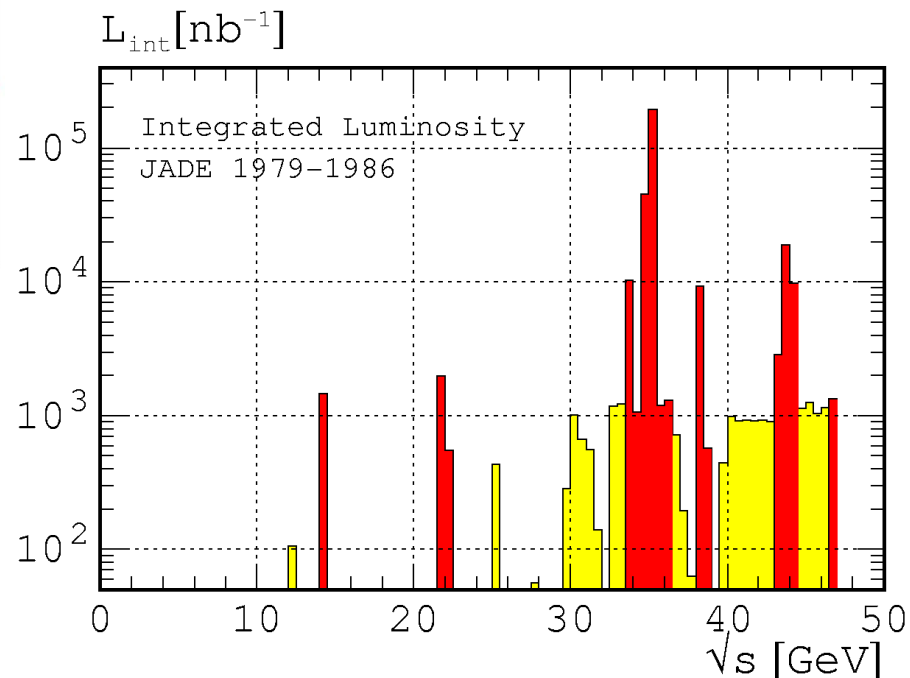
JADE data



Data samples:

$O(10^3 - 10^4)$ events

Negligible backgrounds after selection





Resurrection history

JADE

- 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 cartridges 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 mainframes
 - 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 negligible
 - Usage fees in computing centre?
- Low effort to stay afloat, retain high visibility