

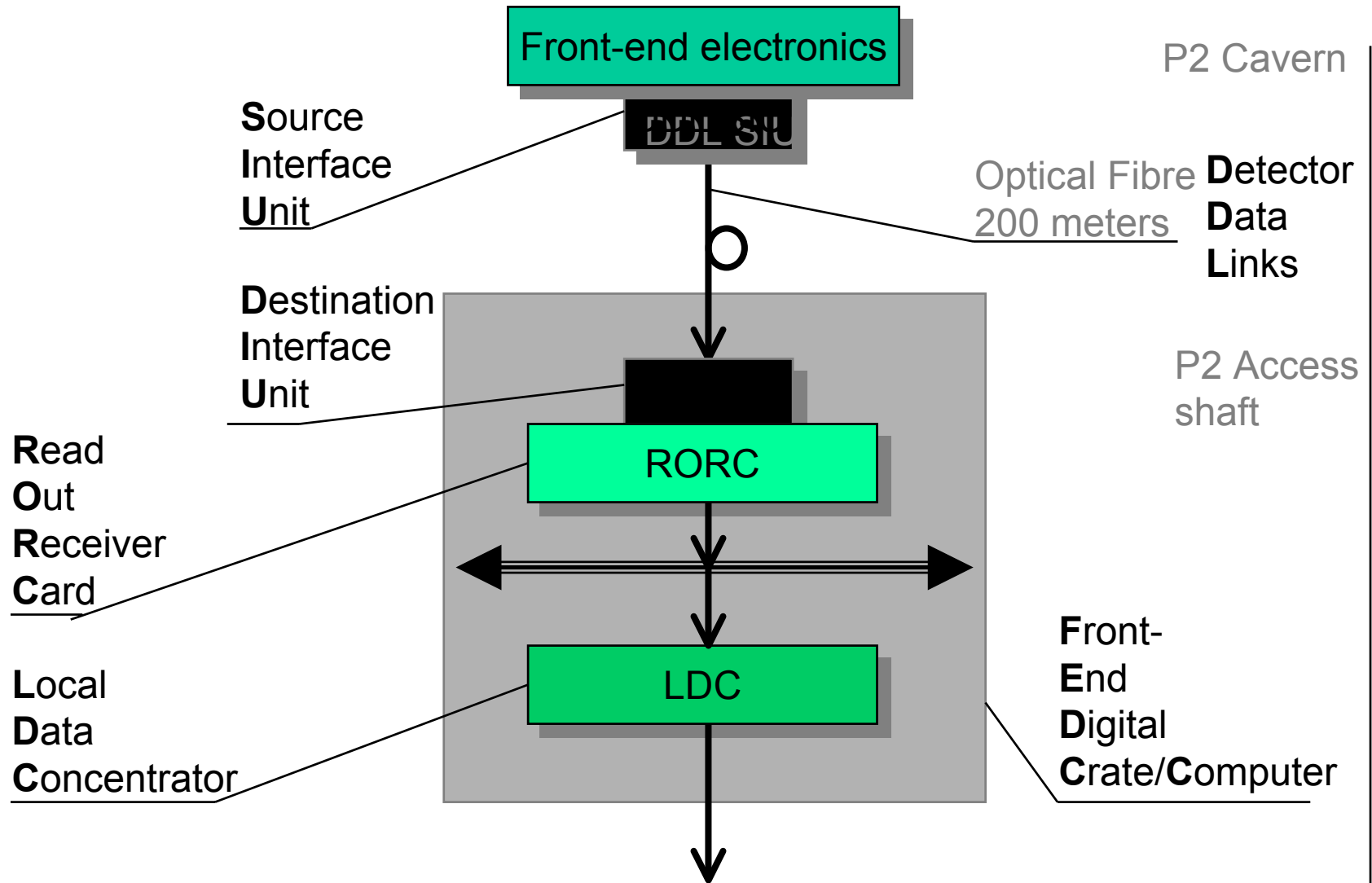


# Presenting the ALICE Detector Data Link

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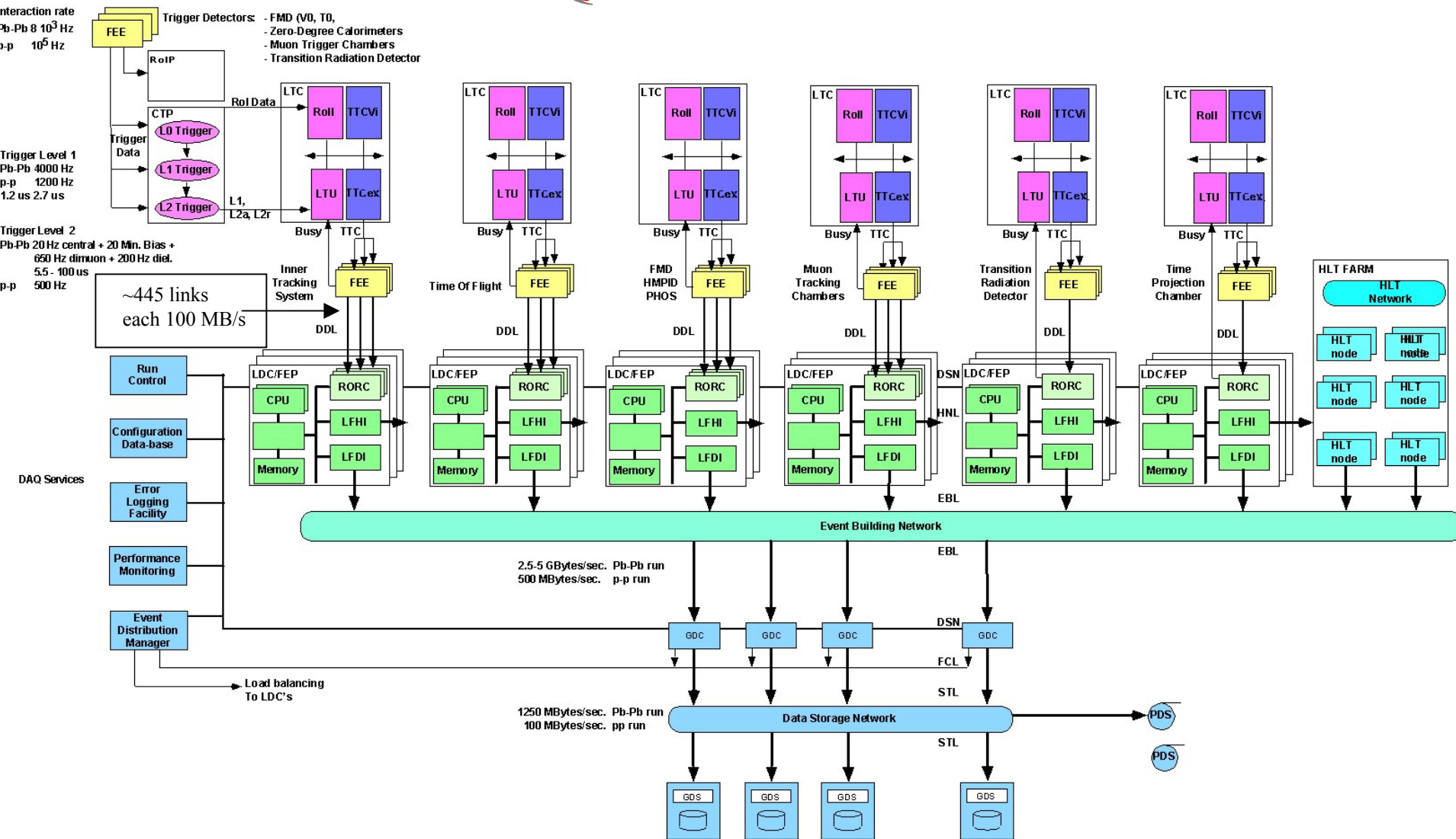


# ALICE DAQ: data transfer





# DAQ Architecture



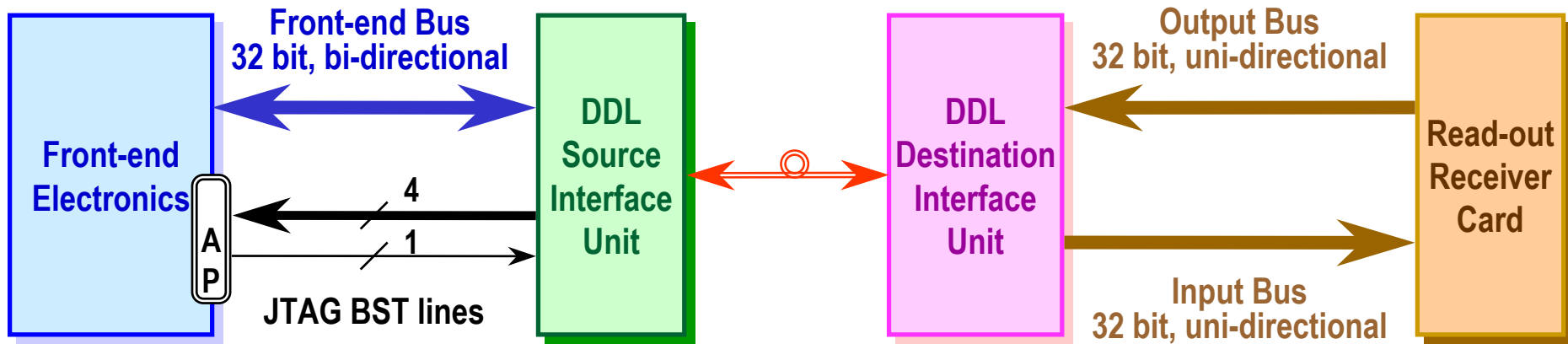


# DDL CONCEPT

## DDL INTERFACES

FEE - SIU Interface

RORC - DIU Interface



JTAG BST - *Joint Test Action Group Boundary-Scan Testing Architecture (IEEE Std 1149.1-1990)*

TAP - *Test Access Port*

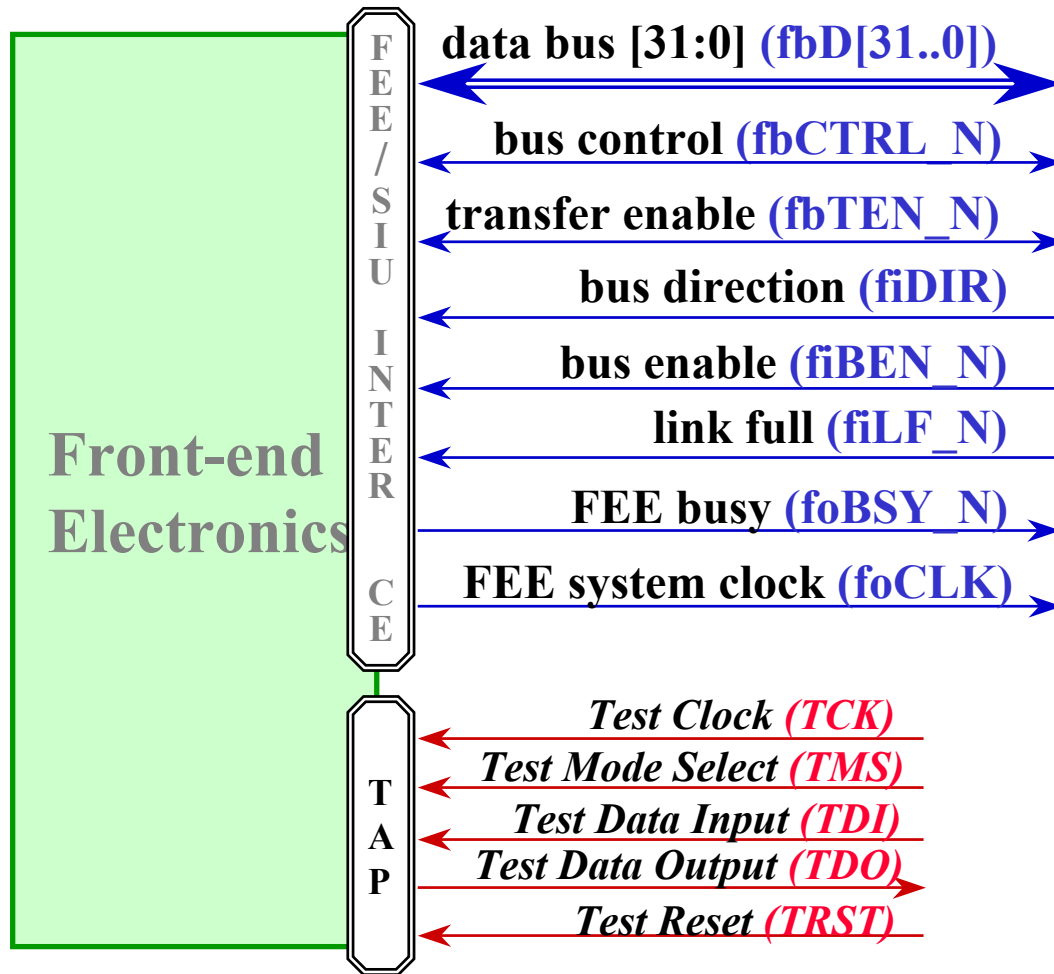


# REQUIREMENTS

REQUIREMENT	STATUS
Data transmission speed from FEE to the DAQ at up to 100 MB/s	$\geq 100$ MB/s
Data transmission speed from DAQ to the FEE at up to 10 MB/s	$\geq 10$ MB/s
Flow control in each directions	Implemented
SIU completely controlled by the DAQ through the DDL.	Implemented
Detected bit error rate (BER) $< 10^{-15}$	$< 10^{-12}$
SIU power dissipation $\leq 5$ W	$\leq 3$ W
CMC compatible SIU and DIU form factor	Implemented
SIU radiation tolerance: $TD < 30$ krad, neutron flux $4 \cdot 10^{11}$ n/cm <sup>2</sup>	Tested
JTAG control through the FEE – SIU interface	To be Done

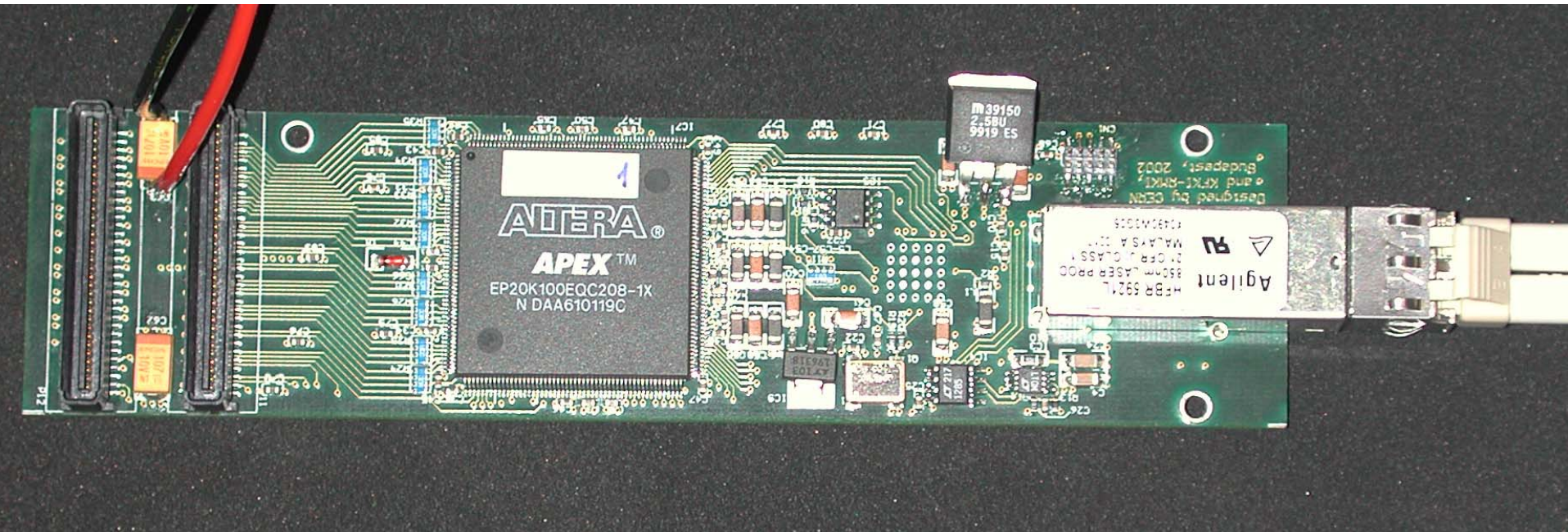


# FEE-SIU HW Interface





# The DDL Link Card





# Features of the PCI RORC

- Interface between the DIU and PCI local bus
  - 32-bit/33 MHz PCI version, max. throughput 132 MB/s
- PCI master capability, data push architecture
  - Autonomous operation with little software assistance
  - Supports multi-paged memory management
- Direct data transfer to the PC memory
  - No local memory on the board
  - Small elasticity buffers between different clock domains
- Built-in test capability
  - Internal pattern generator can produce formatted data

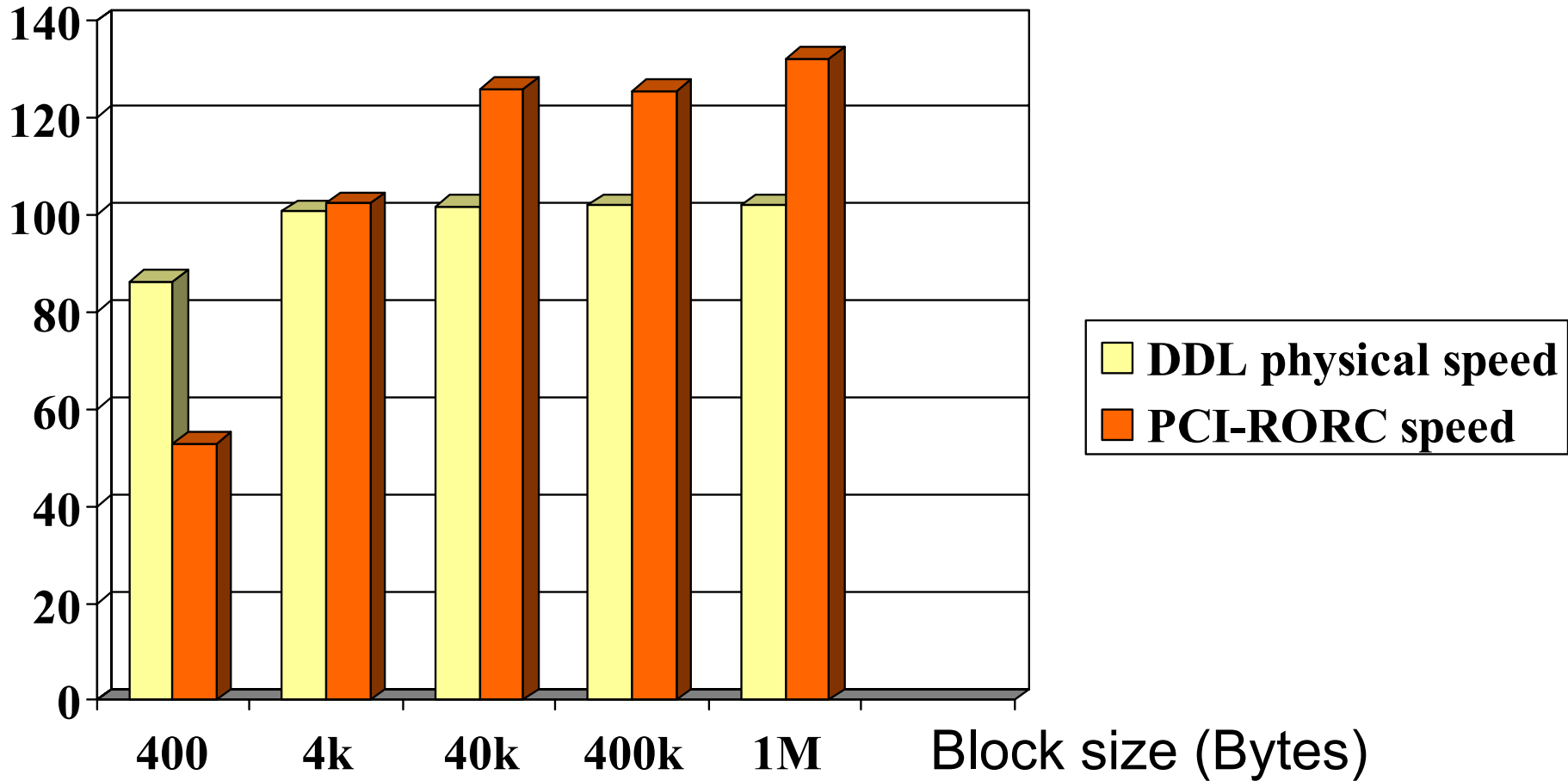
# PCI-based RORC





# PCI RORC performance

MByte/s





# You want to know more about the ALICE DDL...

## ***On the web:***

- *<http://cern.ch/ddl>*

## ***ALICE internal notes:***

- *ALICE-INT-1998-21 v.1.3*

*ALICE DDL - Hardware Guide for the front-end Designers*

- *ALICE-INT-1999-03 v.1.1*

*ALICE Detector Data Link - Users' Guide for the SIU Simulator*

- *ALICE-INT-1999-04 v.1.1*

*ALICE Detector Data Link - Users' Guide for the SIU Extender*

- *ALICE-INT-2002-xx v.1.1 (no number yet)*

*ALICE Detector Data Link – Proposal for the final SIU*

- *ALICE-INT-2002-09 v.3.0*

*ALICE Detector Data Link – pRORC Library User's Manual (Version 2.2)*