

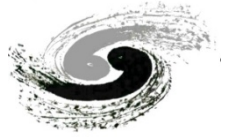
Budget

Zhijun Liang

IHEP

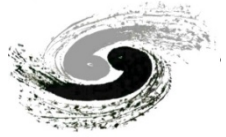
Sept. 27, 2017

Overall budget (18M)



- Equipment 设备费 : 2.5 M RMB
 - Material fee 材料费 : 2.2 M RMB
 - Testing and manufacturing fee(测试加工费) : 5.5M
 - fuel power cost: 0.6M
 - Travel (差旅费) : 0.5M
 - Conference fee (会议费) : 0.9 M
 - International cooperation and exchange(国际交流费) : 1.5M
 - Labor cost (劳务费) : 3.5 M
 - publication / literature / information dissemination /
 - intellectual property services 0.7M , 70万
 - consultant fee (专家咨询费) 0.1 M , 10万
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Testing fee (5.5 M)

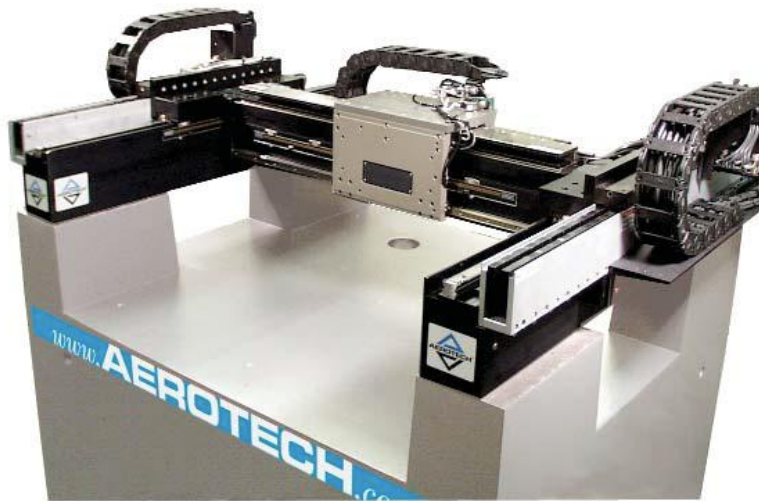


- 5 MPW runs (1.5 M)
 - Taking TowerJazz CiS 180nm high resistance process as example.
 - MPW runs 300 thousand yuan / time * 5 times =1.5 million
- Engineering runs (4M)
 - 2 million / times * 2 times =4 million yuan.

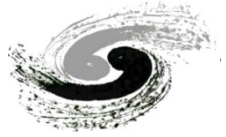
Equipment (~ 2.5M)



- Gantry system from Aerotech company, 1 million RMB
 - Robot for automatics pixel ladder assembly
- Probe station with temperature control system, 400k
 - Radiation hardness study

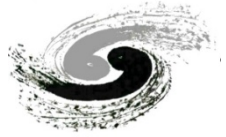


Other Equipment fee



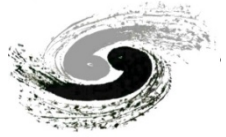
- An advanced oscilloscope Tektronix DPO7354 model, 310 kRMB
- One Function generator, Tektronix AWG5002C, 300 kRMB
- 5 FPGA evaluation boards , ~50k RMB
- High voltage source ~ 300k RMB
- Low voltage source ~ 100k RMB

Material fee : electronics



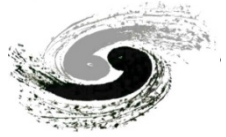
- Testing in the lab (laser test, source test)
 - Probe card: (150k, 15万)
 - PCB boards manufacture (36万, 360k RMB)
 - 3k (per board) X 15 board each time X 8 times
 - Components on PCB board : (16万 ,160k RMB)
 - ADC + pre-amplifier + FPGA + Supporting ASIC Test beam
 - Low-material Soft PCB boards (15 万 ,150k)
 - 15k per time x 10 times
 - Components on soft PCB board : (10万,100k)

Material fee : mechanism



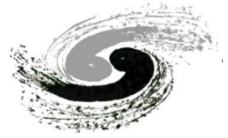
- Support structure for pixel ladder (350k, 35万)
 - carbon fiber board
- Toolings for ladder assembly (300k, 30万)
- Metal supporting structure for multi-layers of tracker prototype (200k, 20万))
- Wire bonding (250k, 25万)
- Cable (100k, 10万)
- Cooling , temperature monitoring (150k, 15万)
- Vacuum system (50k, 5万)
- Clean room material (30k, 5万)

international cooperation and exchange (1.5M)



- International conference fee, 500k (50万)
 - IEEE radiation detector conference, Vertex conference
 - 25k per trip X 20 trips
- Foreign experts exchange program, 240k (24万)
 - 20k per person X 12 persons
- Experiment aboard 750k (75万)
 - Schedule four test beams at DESY/CERN/SLAC ...
 - each time 4~6 persons
 - 25k per trip X 40 trips

Labor cost (3.5M)



- 6 postdoc (2.4 M)
 - 5000 RMB/month/person x 12 months x 6 person x 5 years
- 10 students (~1.1 M)
 - 1500RMB/month/person x 12 months x 12 person x 5 years =1.08 million RMB

intellectual property services



- FPGA Design Vivado (50k)
 - <https://china.xilinx.com/products/design-tools/vivado.html>
- PCB design : Altium (50k)
 - <http://www.altium.com.cn/altium-designer/overview>
- IC design software (400k) ?