JHF-SK ν Workshop

May 30 2001
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Kyoto univ

- **Atmospheric neutrinos**
  - Where to look for ($\Delta m^2 = 1.6 \cdot 10^{-3} \sim 4 \cdot 10^{-3}$ eV^2 , $\sin^2 2\theta > 0.89$)
  - Small ν_e appearance ($\sin^2\theta_{13} < 0.2$) (reactor)
  - No sign of sterile
- **K2K**
  - Spectrum distortion
  - Experience, what to avoid etc.

- **Present results $\Rightarrow$ Next project**
- **What is the fastest, the most productive way to reach GUTs physics ?**

Physics in future neutrino oscillation experiments

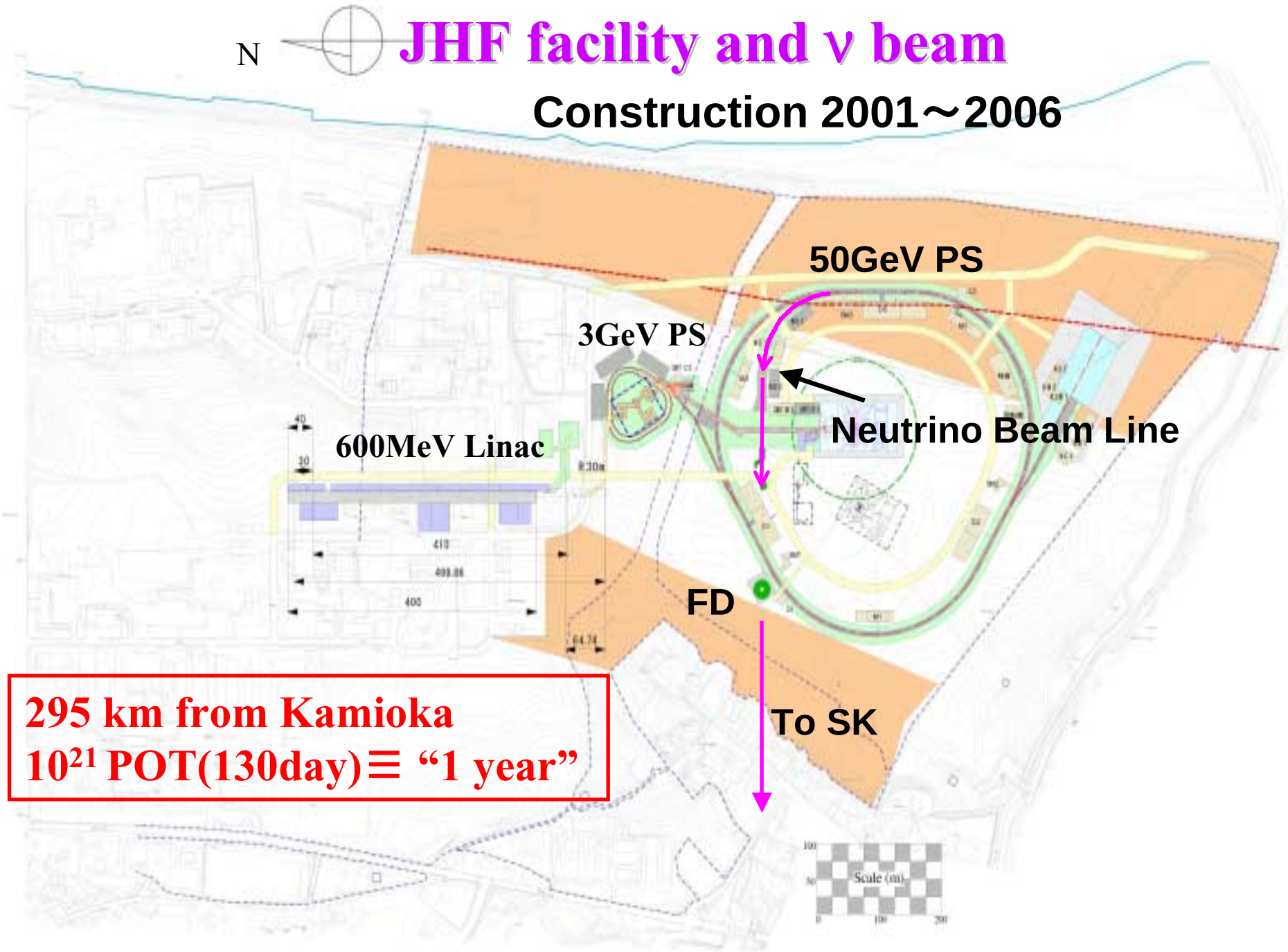
- **Neutrino oscillation**
  - **Direct measure of Mass – Flavor relation**
    - **Generation**
  - **Small but non-zero mass**
    - $m_\nu = M_D^2/M_M$ **Physics at** $M_M \sim M_{GUTS}$

    ⇒What are M_D's ?
  - **Majorana mass, large mixing**
    - **B-L violation (ΔL=2)**
    - **CP violation in lepton sector**

    ⇒Lepto-genesis natural?
- **Proton decay**
  - **Direct GUTs physics**
- **Large water Cherenkov + Sub-GeV ν beam**

JHF facility and ν beam

Construction 2001～2006



295 km from Kamioka

10^{21} POT(130day)≡ “1 year”

JHF Neutrino Working Group

ICRR/Tokyo-KEK-Kobe-Kyoto-Tohoku-TRIUMF

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http://neutrino.kek.jp/jhfnu

Dec.99: Working group formed.
Mar.00: Letter of Intent prepared
Now : Working to prepare a proposal

Many problems must be solved

- **Beam**
- **Super-conducting magnets in radiation**
- **Target**
- **Beam monitor/near detector for high precision measurements**
- **Operation of high intensity accelerator in Japan**

- **International relation**
  - **SK, K2K collaboration**
  - **Beam software, Horn experts from CERN ・・・・・・・**
- **Start actual construction 2002**

Immediate concern (home work)

- NEED EXPERT HELP
  - Radiation shielding – consistent ?
  - Decay volume - almost fix the experiment (start 2002)
  - Target
  - Optics – S.C. magnets
    - Emittance ? scraper effective ? beam loss in s.c.
  - Maintenance in high radiation area
    - OAB changeability
  - Proton beam monitor
  - near/far ratio
    - insitu
    - HARP 3 (if involved, what measurements)