

# Summary of H<sup>-</sup> stripping session

1. Motivation      concentrate upon stripping media!

2. Laser Stripping Part (Chair : Y.Y.Lee)

- three stripping schemes proposed
  - two .... 3 step ( $H^- \rightarrow H^0$ ,  $H^0 \rightarrow H^{0k}$ ,  $H^{0k} \rightarrow p + e$ )
  - one .... 2 step ( $H^- \rightarrow H^0$ ,  $H^0 \rightarrow H^{0k} \rightarrow p + e$ )
- FP cavity (6m long, 10 kW/cm<sup>2</sup>, 10mm diameter) is available! (Cantatore)
  - an advanced technique of another field!
  - a step up of accelerator technique is expected!
- 3 step scenario
  - problems of 2nd step:
    - 1) Doppler broadening of transition frequency due to the momentum spread of  $H^0$  beam.
    - 2) Competition of pumping up and down suppress population of the upper state (efficiency  $\lesssim \frac{1}{2}$ )
    - 3) necessary Laser power density

Gastaldi:

- 1) .... scanning of transition frequency in a slight magnetic field gradient
- 2) .... no special measure. efficiency  $\sim \frac{1}{2}$  for full stripping  $\sim 4$  systems.  
useful to share beam in many users.

## *K. H Stripping, IEast*

*Conveners: Isao Yamane (KEK), Y.Y. Lee (BNL)*

*Secretary: Aimin Xiao (Fermilab)*

- Laser
- 1. Motivation of this session
  - 2. Review on laser assisted stripping
  - 3. Feasibility of laser stripping via a broad Stark state for charge-exchange injection into a high intensity proton ring
  - 4. A novel solution for  $H^-$  laser stripping
  - 5. PVLAS developments on Fabry-Perot resonators locked to CW lasers and suitable for laser assisted Lorentz stripping of  $H^-$  beams
  - 6. Carbon stripping foil experience at PSR
  - 7. Present status of development of carbon stripper foils at KEK
  - 8. The SNS strategy for  $H^-$  stripping

I. Yamane (KEK)  
Ugo Gastaldi (INFN)

I. Yamane (KEK)  
Slava Danilov (ORNL)

G. Cantatore et al. (INFN)  
M. Borden et al. (LANL)

Isao Sugai et al. (KEK)  
Y.Y. Lee (BNL)

Foil

**ICFA-HB2002,  
H<sup>-</sup> Stripping Session,  
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## **Motivation of this session**

**We are now in uneasy situation with stripping media!**

Solid foils do not seem enough durable against MW proton beam.

Although laser stripping seems promising, but we have not yet found out a realistic way of laser stripping.

**Motivation of this session is**

**to find out a break through to this situation**

**or at least any hint leading to it**

**by exchanging and discussing recent results of study in  
the world.**

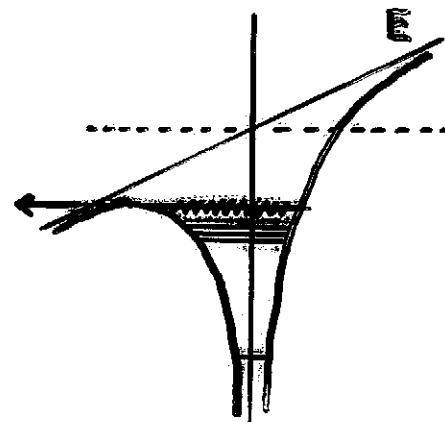
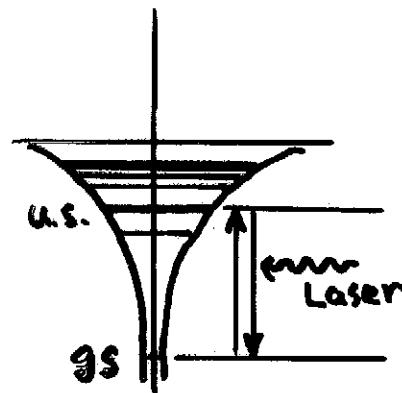
1st Step

3 step

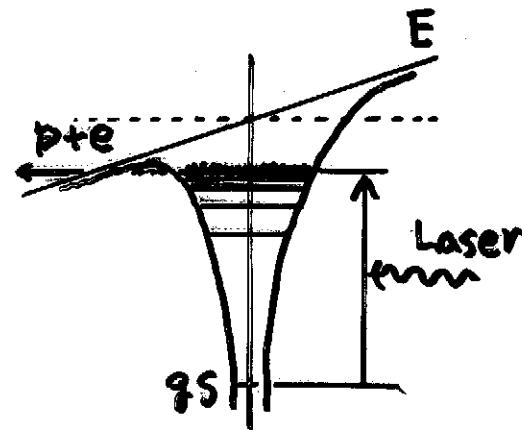


2nd Step

3rd Step



2 step



3) .... a FP cavity

Danilov :

- 1) .... cancel of Doppler shift by colliding angle and dispersion derivative.
- 2) .... Froissart - Stora Solution
- 3) .... Recycling of laser beam

- 2 step scenario .... Yamane

a resonant photo-ionization via a broad Stark state, to cover Doppler broadening  
to avoid pumpingdown ( $H^{\alpha*} \rightarrow H^{\alpha}$ )

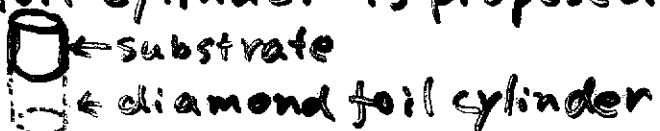
laser ... FP cavity

3 Foil Stripping Part (chair : I. Yamane)

- Borden : experience on stripping foils at LANL-PSR

- Sugai : "cluster foil" long lived foil  
Temperature control (at 750°C) in bombardment

- Mae : Diamond Foil is the most long lived foil.  
Problems with Si-Substrat  
Diamond foil cylinder is proposed



## 4 Summary

- It is impressive that patient but steady effort is continued to develop a long lived foil.
- Laser stripping shows a spread and 3 schemes are reported.
- Appearance of FP cavity (6m long,  $10\text{ kW/cm}^2$ , 10nm) encourage and accelerate development of the Laser stripping system.
- A demonstration to show that Laser stripping work well is desirable to be performed as soon as possible.