

Abstract Submitted  
for the HAW05 Meeting of  
The American Physical Society

**Polarized  $^3\text{He}$  ion source, SEPIS based on the spin-exchange collisions** MASAYOSHI TANAKA, Kobe Tokiwa College, YUTAKA TAKAHASHI, KELJI TAKAHISA, MASARU YOSOI, SHIGEHIRO YASUI, RCNP, Osaka-u.ac.jp, YASUHUMI KOMENO, CHIKA INABA, TADASHI SHIMODA, HIDEAKI IZUMI, TAKESHI FURUKAWA, Dept. of Physics, Osaka University — Over the decade we have developed the polarized  $^3\text{He}$  ion source for spin physics research at intermediate energy regions. Though we started constructing an OPPIS polarized  $^3\text{He}$  ion source at first, we failed in obtaining a highly polarized  $^3\text{He}$  beam contrary to the great success in the proton OPPIS. Next, we proposed and checked the validity of an “electron pumping” polarized  $^3\text{He}$  ion source, EPPIS. Though the EPPIS decisively demonstrated its usefulness, the further development is currently suspended because of practical difficulty associated with a budget. To overcome this we proposed a SEPIS polarized ion source based on the enhanced spin-exchange cross sections between alkali atoms and an incident  $^3\text{He}^+$  ion at extremely low energies less than 1 keV, which is expected by the theoretical calculation allowing the quasi-molecule formation. An advantage of SEPIS relative to EPPIS is that no pumping laser with a high intensity, and a high magnetic field to keep the polarization are required. The construction of bench-test device for the SEPIS will soon be in completion. We hope to present not only the present status of the construction of SEPIS but also the first preliminary result on the SEPIS performance in this joint meeting.

Masayoshi Tanaka  
Kobe Tokiwa College

Date submitted: 16 May 2005

Electronic form version 1.4