High-Current H^- Optically-Pumped Polarized Ion Source Development For High Energy Accelerators, A.N. ZELENSKI, INR Moscow, 117312 Moscow, Russia; V.I. DAVYDENKO, G.I. DIMOV, BINP Novosibirsk, 630090 Novosibirsk, Russia; G. DUTTO, C.D.P. LEVY, W.T.H. van OERS, P.W. SCHMOR, G.W. WIGHT, TRIUMF, 4004 Wesbrook Mall, Vancouver, B.C. V6T2A3, Canada - The TRIUMF optically-pumped polarized H^- ion source (OPPIS) produces in excess of 0.2- mA DC of H^- ion current at 85% polarization within a normalized emittance of 0.8 pi mm mrad. A feasibility study of higher current production for application to multi-GeV accelerators and colliders has been performed. A polarized current of 0.55 mA at 85% polarization and of 1.0 mA at 75% within 2.0 pi mm mrad was obtained after upgrading the ECR primary proton source. A maximum H^- current of 1.64 mA was obtained with lower polarization because of a pumping laser power shortage. The required laser power of about 50 W can be easily produced by a pulsed laser with a duty factor suitable for high-energy accelerators. Modified for pulsed operation, the TRIUMF-type OPPIS should produce at least 2.0 mA polarized H^- ion current. The higher
10-20 mA polarized H^- ion current can be obtained in pulsed operation by replacement of the ECR proton source with a high current atomic hydrogen injector. The results of experiments with an atomic H injector are presented.