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Publication Date

2003-08-06

NEW RESULTS WITH VENUS

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The next generation superconducting ECR ion source, VENUS, has recently begun operation at 18 GHz following six years of design and construction. The ion source and its closed cycle cryogenic system will be described along with the design of the 28 GHz 10 kW gyrotron system, which is scheduled for installation at the end of 2003. The low energy beam transport section includes a Glaser lens, a high transmission 90 degree analyzing magnet and a two axis emittance scanner to measure beam transport efficiency and emittance of the intense multi-charged ion beams. Results from the ongoing commissioning at 18 GHz are reported. Initial tests with gases such as helium, oxygen, argon and xenon have been performed with up to 2000 W of 18 GHz RF power. Promising performance has been measured in those preliminary beam tests. For example, 1100 μA of O^{6+} , 180 μA of Ar^{12+} and 84 μA of Xe^{27+} were produced and the dependence of current versus RF power indicates more power is needed for optimum performance. Emittance measurements for various ion species have been performed and are discussed.