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**RF Antenna Design for a Helicon Plasma Source**[1] KATARINA GODDEN, BRENDAN STASSEL, DANIEL WARTA, ISAAC YEP, NATHANIEL HICKS, JENS MUNK, University of Alaska Anchorage — A helicon plasma source is under development for the new Plasma Science and Engineering Laboratory at the University of Alaska Anchorage. The helicon source is of a type [1] comprising Pyrex and stainless steel cylindrical sections, joined to an ultrahigh vacuum chamber. A radio frequency (RF) helical antenna surrounds the Pyrex chamber, as well as DC solenoidal magnetic field coils. This presentation focuses on the design of the RF helical antenna and RF matching network, such that helicon wave power is coupled to argon plasma with minimal reflected power to the RF amplifier. The amplifier output is selectable between 2-30 MHz, with forward c.w. power up to 1.5 kW. Details and computer simulation of the antenna geometry, materials, and power matching will be presented, as well as the matching network of RF transmission line, tuning capacitors, and cooling system. An initial computational study of power coupling to the plasma will also be described. [1] Scime, E. E., Keiter, P. A., Balkey, M. M., et al., *J. Plasma Physics*, **81**, 1–22 (2014), DOI: 10.1017/S0022377814000890

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