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Study of ICRH and ion confinement in the HSX stellarator[1] KONSTANTIN LIKIN, Univ. of Wisconsin - Madison, SADAYOSHI MURAKAMI, Kyoto University, Japan, JOSEPH TALMADGE, Univ. of Wisconsin - Madison — In HSX the power at the electron cyclotron resonance harmonics is used to produce and heat the plasmas. The ion temperature in such plasmas remains low ($<$ 100 eV) as compared to the electron temperature ($\sim$ 2 keV). If the ions can be heated up to a few hundred eV then the ion low collisionality regime becomes accessible and the difference between plasma confinement in quasi-symmetric and conventional stellarator configurations may be more pronounced. Also with RF heating directly to the ions the radial electric field can be varied that will help to study its effect on plasma confinement. The code GNET solves the linearized drift kinetic equation in 5-D space using the full 3-D equilibrium provided by VMEC. With GNET we would like to predict (1) efficiency of ion cyclotron resonance heating (ICRH); (2) fast ion confinement; (3) charge-exchange losses in various regimes; (4) ion confinement in different magnetic configurations. The code has been adapted to the HSX geometry and a new parallel version has been installed on the NERSC Cray computer. Results from GNET on modeling of ICRH and ion confinement in HSX will be presented.

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