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Development of an ion source and plasma injection system for a non-neutral plasma using radioactive ions BRYAN G. PETERSON, DAVID K. OLSON, KELLEN M. GIRAUD, GRANT W. HART, Brigham Young University — We are building an ion trap to study the decay of ionized beryllium-7, an isotope with a 53-day half life (for neutral atoms). Because of the short half life of this isotope it is necessary to frequently change the source. We have designed a modified MeVVA (metal vapor vacuum arc) source which allows us to replace the source target material in a relatively short time so that fresh targets can always be used. We have also designed a quadrupole mass filter/ion injector to transport the desired beryllium-7 ions from the source in a low B-field region into the high-field trapping region while rejecting undesirable ions such as boron and carbon. The design of the source and ion injection system will be discussed and results from testing will be presented.

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