

# **Superconducting Quadrupole Arrays for Induction Linacs.**

Bangerter, R.O. (Bangerter Research)

## **Abstract**

Induction linacs for heavy ion fusion require large numbers of multi-beam arrays of superconduction quadrupoles. Design and development of these arrays pose unique challenges. There are a number of important, unanswered questions relating to conductor geometry, optimal bore size, and beam tube operating temperature (warm bore vs. cold bore). The conductor geometry affects the reliability and cost of the magnets. The bore size can affect the emittance of the beams and, therefore, their ability to be focussed. The beam tube operating temperature can strongly influence the vacuum. It therefore has a big influence on beam loss, activation, and perhaps beam dynamics. The beam tube operating temperature also influences the refrigeration requirements. This paper will address the issues outlined above. Specifically, it will present a novel conductor geometry and discuss the connection between conductor geometry and optimal bore size. It will also discuss the tradeoffs associated with different beam tube temperatures.