# Abstracts

## Conformal Array Microwave Applicator for Superficial Hyperthermia of Large Contoured Surfaces

*P.R. Stauffer, C.J. Diederich and D. Bozzo. "Conformal Array Microwave Applicator for Superficial Hyperthermia of Large Contoured Surfaces." 1994 MTT-S International Microwave Symposium Digest 94.1 (1994 Vol. I [MWSYM]): 531-534.*

Local hyperthermia continues to offer great promise as an adjuvant to radiation and chemotherapy treatments for cancer but its clinical use is severely restricted by technical difficulties in producing adequate uniformity of heating. This paper describes the design and radiation field characteristics of a novel dual concentric conductor microwave radiator which may be combined into multi-aperture arrays for heating large contoured superficial tissue regions at 915 MHz. Power deposition patterns for single aperture and multi-element array applicators were quantified with detailed electric field measurements in tissue equivalent phantom models and with temperature distributions obtained during clinical treatments of human chestwall tumors. The data demonstrate that power deposition patterns measured in a plane 1 cm deep in muscle equivalent phantom material remain above approximately 50% of their peak value out to the perimeter of each 3.5-5 cm square aperture tested. In addition, conformal arrays with up to 24 such apertures driven non-coherently can be used to heat large contoured human chestwall disease to acceptably uniform temperatures within the range of 41.5-44°C, with improved patient tolerance compared to previously used bulky waveguide applicators. These new applicators offer improved utility in the clinic due to their thin flexible construction which allows the applicator to conform tightly but comfortably to complex surface contours. Planned improvements on this preliminary conformal array design will allow the delivery of external beam radiation directly through the applicator to take advantage of the improved synergism between simultaneously applied modalities.

❑ Return to main document.