

WHY DO WE NEED “DIGIDARN” – A GLOBAL NETWORK OF DIGITAL SUPERDARN RADARS?

M. L. Parkinson⁽¹⁾, J. S. Whittington⁽²⁾, and J. C. Devlin⁽³⁾

⁽¹⁾*Department of Physics, La Trobe University, Victoria 3086, Australia*
m.parkinson@latrobe.edu.au

⁽²⁾*Department of Electronic Engineering, La Trobe University, Victoria 3086, Australia*
j.whittington@latrobe.edu.au

⁽³⁾*As (2) above, but E-mail: j.devlin@latrobe.edu.au*

ABSTRACT

The Super Dual Auroral Radar Network (SuperDARN) is an international network of oblique HF over-the-horizon radars dedicated to the study of ionospheric convection. This paper argues why a fully digital redesign of SuperDARN needs to be developed. A network of “DigiDARN” radars will help to solve data consistency and quality problems, and greatly increase the amount of ionospheric echoes recorded across extended spatial regions through a combination of time and frequency multiplexing, and enhanced, adaptive beam forming. The use of field programmable gate array (FPGA) technology will enable flexible experimental research at the cutting edge of modern space physics.