

## **T.2. P.R. SASEENDRAN PILLAI—Studies on Underwater Propagation—1982—Dr. C.S. Sridhar**

One of the most peculiar limitations that stands in the way of achieving maximum transmission range in sonar systems is caused by the 'mutual interaction effect' among the radiating elements of a closely packed projector array. Unless this effect is compensated for in the design of the array, it will cause severe complex effects at higher drive levels. An attempt has been made, in this work,

for designing and developing sonar projector arrays taking into account the interaction effect.

In order to minimise the mutual interaction effect in an array system, a loosely packed array (LPA) format has been proposed. This LPA format has the unique advantage that closely packed planar projector arrays, the elements of which are arranged at half-a-wavelength apart can be converted into the proposed format by selectively switching only those elements that produce the desired beam characteristics. The selective switching of the elements of the closely packed array is achieved by a microprocessor based switching system. The switching system and the closely packed arrays have been suitably implemented to achieve lobe switching, shading by average amplitude in time (SAAT) and higher array gain, with suitable program controls. A programmable array has been developed and implemented for achieving lobe switching and SAAT operation. Finally, one of the applications of the LPA format for the generation of low frequency sound beams through nonlinear interactions has also been suggested.