ZOLTAN BERKES

**ASSOCIATE PROFESSOR,
MATHEMATICAL & PHYSICAL SCIENCES**

THE FAR FIELD WAVE PATTERN OF A SPINNING SPHERICAL RADIATOR

Introductory investigations into the interference of wave fields are presented at all levels of physics education.

Easily observable beat phenomena due to two sound sources of slightly different frequencies located spatially close to each other are routinely treated in the textbooks and demonstrated in the student laboratory setting.

The wave field resulting from two wave sources of identical frequency that are spatially separated is usually demonstrated by the interference pattern of monochromatic light beyond a double slit or diffraction grating. The pedagogical preparation to aid the easier understanding of this phenomenon is usually displayed by observing the surface waves of water-tank experiments. Interestingly enough, there hasn't been any substantial investigation into the properties of a wave field generated by an array of multiple monochromatic wave sources that are different in frequency and separated spatially. Due to the continuously shifting interference conditions, they generate a pattern of spatially scanning wave packets.

I suggest that a fast spinning spherical radiator may emit the same scanning wave pattern due to the gradual relativistic Doppler shift between zones of the receding and approaching lobes of the spinning sphere. Comparison to the detected signals from certain heavenly objects, (i.e., pulsars) could suggest an alternative model to those currently accepted.