

**SPECTRAL PROPERTIES OF RELIGIOUS CHANTS:
A COMPARATIVE STUDY OF GREGORIAN CHANT, VEDIC CHANT,
AND PARITTA SAJJHĀYANĀ**

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Religious chants play a significant role in various spiritual traditions across the world. Religious chants, such as Gregorian, Vedic, and *Paritta Sajjhāyanā*, are integral to the spiritual practices of various cultures, each exhibiting unique acoustic properties. This study aims to explore and compare the spectral characteristics of these chants, focusing on the variation of spectral centroid, variation of pitch, and variation of energy. By comparing these chants, the paper aims to provide a deeper understanding of their unique spectral characteristics and their cultural significance. A total of 170 chant recordings were analyzed, including 100 Gregorian chants, 20 Vedic chants, and 50 *Paritta Sajjhāyanā*, which were recorded at a sampling frequency of 44100Hz and were used as a primary source. Each prescribed sound sample was divided into one-second segments, estimated using a computer program, and plotted onto a feature space. Further, the results obtained through the computer program have been considered for spectral analysis. The results indicated that the spectral properties of religious chants are closely linked to their cultural and spiritual significance. With its narrow pitch range and low spectral centroid, Gregorian chant creates a calm and meditative atmosphere. Vedic chant, with its complete pitch structure and higher spectral centroid, reflects the precision and complexity of the rituals they accompany. *Paritta Sajjhāyanā*, with their variable spectral properties, are versatile and adaptable to different spiritual contexts. Overall, it can be examined that Gregorian chant, Vedic chant, and *Paritta Sajjhāyanā* represent three distinct religious music traditions, each with its unique acoustic characteristics. The study's implications extend to fields such as music therapy, acoustic modeling, and cultural preservation, where these chants' unique spectral and energy characteristics can be utilized for therapeutic and analytical purposes. Finally, this research has provided a comparative analysis of the spectral properties of Gregorian, Vedic chants, and *Paritta Sajjhāyanā*, highlighting the unique acoustic characteristics that define each style. Understanding these properties enhances our appreciation of the role of sound in spiritual practices and offers insights into the cultural significance of these chants.

Keywords: Gregorian chant, Vedic chant, *Paritta Sajjhāyanā*, spectral properties