Spectral Analysis of Matteucci Effect Based Magnetic Field Sensor

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Abstract. DC magnetic field sensor similar to fluxgates utilizing Matteucci Effect was proposed previously. As these types of sensors depend on measuring the second harmonic of the signal, a spectral analysis of Matteucci effect signal was measured. Results indicate that each harmonic is periodical with the increase of DC magnetic field and the period decreases with the harmonic number, making higher harmonics better suitable for lower measurement ranges. Thus, measurement range of the proposed sensor can be selected by tuning to proper harmonic frequency. Moreover, there is no difference in signal amplitude between odd and even harmonics, so any of them could be used for signal extraction.