Inverter high frequency vibration

Do permanent magnet synchronous motors emit high-frequency vibration noise?
Abstract: Permanent magnet synchronous motors (PMSMs) driven by voltage source inverters (VSIs) with pulse width modulation (PWM) are widely used. Given the impact of acoustic noise on the environment and human ears,the comfort level of the high-frequency vibration noise emittedby PMSMs has become an important factor.

Do inverters and pulse width modulation cause resonance in permanent magnet synchronous motors?
Abstract: The utilization of inverters and pulse width modulation (PWM) technology in driving permanent magnet synchronous motors (PMSMs) introduces high-frequency sideband electromagnetic force. Consequently,the risk of PMSMs resonance inevitably increases,leading to disruptions in the operating state and increased noise radiation.

How do vibrational harmonics manifest in an inverter?
In other words, it can be anticipated that the vibrational harmonics generated by the inverter will manifest themselves at frequencies that are either slightly above or below the frequency of the electrical spectrum of the modulated wave applied to the electric motor.

How to reduce high-frequency vibration noise in PMSMs?
This study introduces the current mainstream high-frequency vibration noise suppression strategies for PMSMs by reducing the high-frequency current harmonics of stator windings, including spread spectrum technology, vector position exchange technology, and interleaved parallel technology.

The high-frequency electromagnetic noise caused by a frequency converter power supply has become the main composition of the vibration and noise of frequency-converter ...

From this study, observations from NVH tests on an EV inverter is highlighted in frequency range where relatively high vibration ...

Inverter-driven asynchronous motor loads represent typical operational scenarios in shipboard integrated power systems. The inverter's output impedance characteristics are ...

The vibration results and quality parameters of the inverter output waveform obtained through the proposed modulation technique will be compared with results from other ...

The problem of large-capacity multiphase motor system high-frequency vibration and noise caused by pulse-width modulation (PWM) is prominent. At present, carrier phase ...

Hence it can be concluded that AC current ripples cause high level of vibration and acoustic noise response around switching frequency ...

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