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标题: Feasibility Study on Terahertz Imaging of Corrosion on a Cable Metal Shield

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摘要: The possibility of nondestructive diagnosis of corrosion on a metallic shielding layer in a power cable by time-domain imaging and spectroscopic measurements using terahertz waves was examined experimentally. First, absorbance was measured in a THz frequency range for copper oxide, basic copper carbonate, and copper chloride. Next, two copper plates, uncorroded and corroded, were placed in contact with each other horizontally, and a terahertz wave was scanned over them in order to get two-dimensional images. When the plate is corroded to form either basic copper carbonate or copper chloride, the intensity of reflected wave becomes lower than when the plate is uncorroded. It seems that the terahertz wave was scattered more on the surface of the corroded copper plate and was absorbed by the corrosion. Therefore, this research indicates the feasibility of nondestructive diagnosis to detect corrosion on a shield metal in a power cable. (C) 2012 The Japan Society of Applied Physics

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