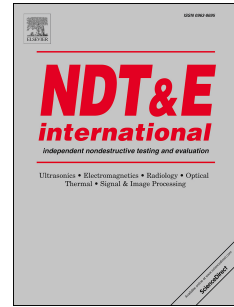


Accepted Manuscript

Analytical model of the eddy current response of a drive-receive coil system inside two concentric tubes - Highlights

Geoffrey Klein, Jordan Morelli, Thomas W. Krause



PII: S0963-8695(17)30397-3

DOI: [10.1016/j.ndteint.2018.03.003](https://doi.org/10.1016/j.ndteint.2018.03.003)

Reference: JNDT 1959

To appear in: *NDT and E International*

Received Date: 27 June 2017

Revised Date: 7 March 2018

Accepted Date: 7 March 2018

Please cite this article as: Klein G, Morelli J, Krause TW, Analytical model of the eddy current response of a drive-receive coil system inside two concentric tubes - Highlights, *NDT and E International* (2018), doi: 10.1016/j.ndteint.2018.03.003.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Analytical Model of the Eddy Current Response of a Drive-Receive Coil System inside Two Concentric Tubes

Geoffrey Klein^{* 1,2}, Jordan Morelli¹, and Thomas W. Krause²

1. Department of Physics, Queen's University, Kingston, ON, Canada, K7L 3N6

2. Department of Physics, Royal Military College of Canada, Kingston, ON, Canada, K7K 7B4

Abstract— A semi-analytical model of the eddy current response of a drive-receive coil configuration inside two conducting concentric tubes, where the coil axes are perpendicular to the inner tube's surface, is solved using the second-order vector potential formalism. This model determines the voltage response in the receive coil under a constant amplitude alternating drive voltage, accounting for all possible coupling terms in the system. Modeled receive coil voltage responses to changes in outer tube diameter, greater than the drive-receive coil spacing, are compared with experimental measurements and finite element method (FEM) modeling in the impedance plane. Analytical model results are found to be in excellent agreement with both experiment and FEM model results, thereby verifying the solutions.

Index Terms—Eddy current, analytical model, second order vector potential, nondestructive testing

* Corresponding author: geoff.a.klein@gmail.com

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات