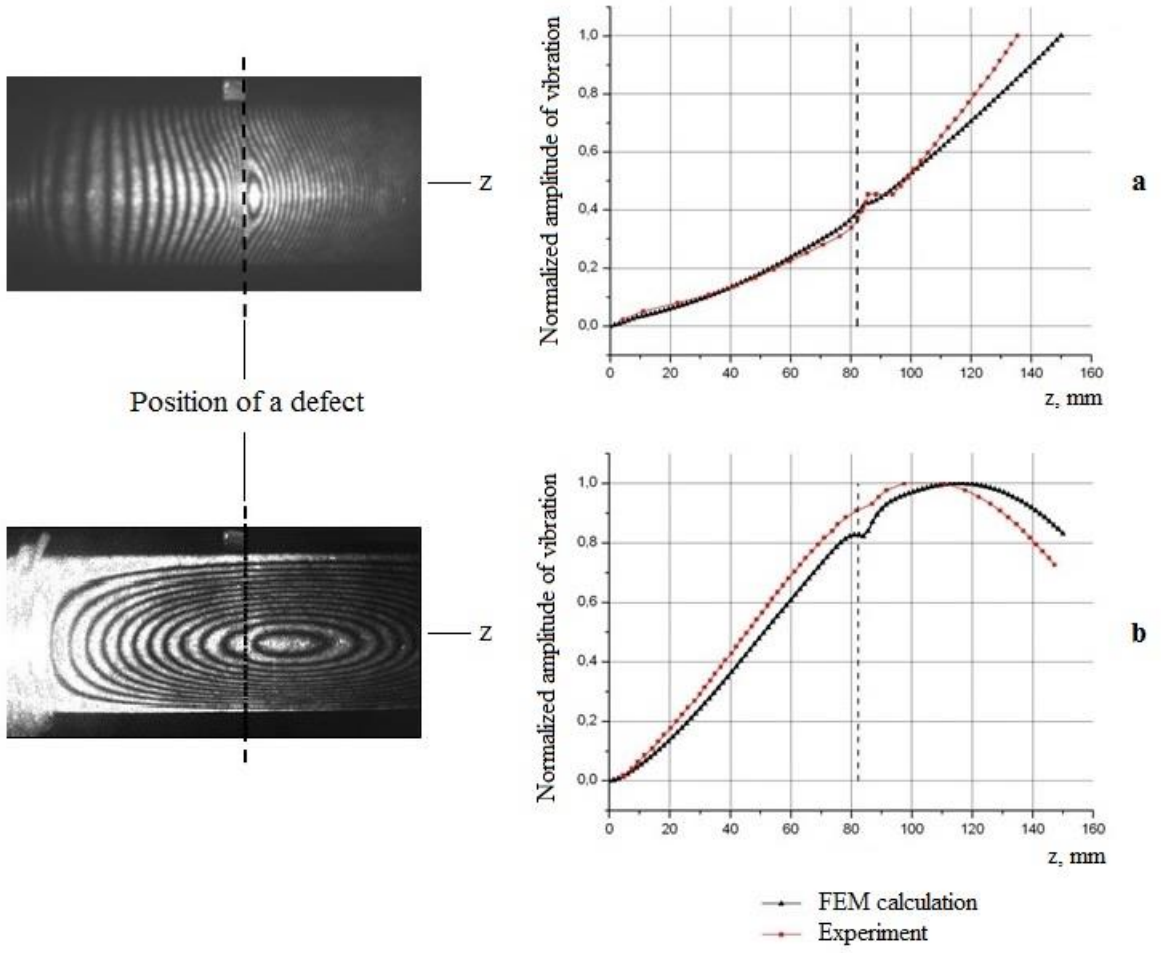
Active vibration diagnostics

Active vibration diagnostics is an engineering method intended to detect hidden defects in the structures of equipment and pipelines at any of the post-project stages of their life cycle. This method is a development of the well-known technology of vibration diagnostics (vibration-noise diagnostics) used in nuclear engineering. The actual problems of such technology are considered, for example, in the article:

Sizaryov VD, Spirochkin YK (2008) Vibrodiagnostirovanie kak odno iz napravlenii v ekspluatatsionnom monitoringe resursnykh kharakteristik oborudovaniya korabel'nykh PPU (Vibration diagnostics as one of the directions in the operational monitoring of the life of equipment of ship steam-producing installations). Godovoi otchyot FGUP NIKIET - 2008: Sb. statei/ Pod red. E. O. Adamova (In Adamov EO (ed) Annual report of NIKIET - 2008: Collection of articles), p 128-129. NIKIET, Moscow.

Generic features of the **traditional technology, which can be called passive vibration diagnostics**, narrow its applicability during operation. The method of **active vibration diagnostics**, which was proposed by the author in 2007, **makes it possible to eliminate the existing limitations on applicability**.



An example of active vibration diagnostics: A pipe specimen with a circumferential defect on the inner surface: Amplitudes of radial vibration displacements: a in the first beam vibration mode and **b** in the first shell vibration mode

A description of this method can be found in the following publications:

Spirochkin YK, Atroshenkiv RS (2010) Spocob diagnostirovaniya skrytykh defektov konstruktsii oborudovaniya i truboprovodov (Method for diagnosing hidden defects in equipment and pipeline structures). Patent RU 2,437,072, June 09, 2010. https://patenton.ru/patent/RU2437072C1

Spirochkin Y, Atroshenkov R and Odintsev I (2010) On active diagnostics method for assessment of technical condition of nuclear facility components. Proceedings of the ASME 2010 10th Biennial Conference on Engineering Systems Design and Analysis. ASME 2010 10th Biennial Conference on Engineering Systems Design and Analysis, Volume 2. Istanbul, Turkey. July 12–14, 2010. p 329-334. ASME. https://doi.org/10.1115/ESDA2010-25089

Spirochkin YK (2019) Bezopasnost' rossiiskikh AES s tochki zreniya inzhenera-mekhanika (Safety of Russian nuclear power plants from the viewpoint of mechanical engineer). SUPER Publishing House, Saint Petersburg. https://www.super-izdatelstvo.ru/product/bezopasnost-rossiyskih-aes-s-tochki-zreniya-inzhenera-mehanika.