

# **Radiation characteristics of a coaxial waveguide with eccentric inner conductor for application in microwave hyperthermia and reflex therapy**

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This paper examines the radiation characteristics of a contact emitter conceived for application in microwave hyperthermia and reflex therapy. It is important to analyse the distribution of power density in the near field area, as the radiator's therapeutic sphere of activity is localized here. The contact emitter is a coaxial radiator with an eccentric course of the inner conductor. According to Huygens principle, a theoretical view of the near field radiation characteristics is made by determining the equivalent current densities in the emitter aperture. It is shown that by an eccentric shift of the inner conductor, an almost isotropic near field radiation pattern and power density can be produced. For this, the electromagnetic field in the emitter aperture is determined by using a bipolar coordinate system. This calculation considers only the fundamental TEM mode of the contact emitter. Besides the theoretical results obtained for near field radiation characteristics, results of near and far field are simulated and as well as measured far field data presented and discussed.