

# **Analysis of input coupler asymmetry influence on particle beam dynamics in accelerators with superconducting cavities**

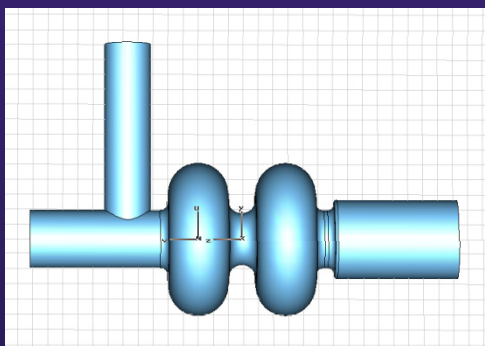
**S.V.Kutsaev, M.A.Gusarova, V.A.Makarov, N.P.Sobenin, MEPHI, Moscow, Russia**

**V.I. Shvedunov, SINP MSU, Moscow, Russia**

**A.A.Zavadtsev, A.A.Krasnov, Affiliate of Scantech Sciences, LLC, Moscow, Russia**

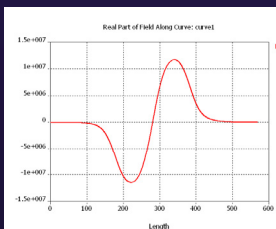
# Analysis of input coupler asymmetry influence on particle beam dynamics in accelerators with superconducting cavities

## Coaxial input coupler

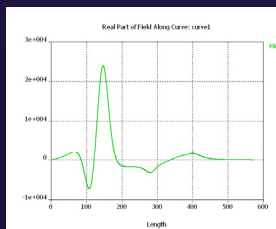


## Components of the EM field on axis of asymmetric coaxial input coupler structure with electric wall boundary condition usage

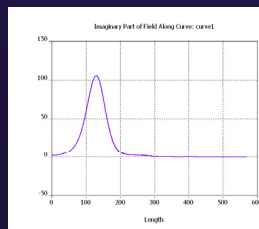
Longitudinal components of electric field



Transverse components of electric field



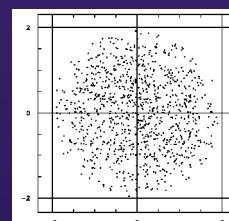
Transverse component of magnetic field



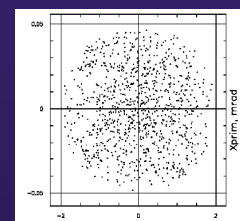
## Beam parameters

cross-section

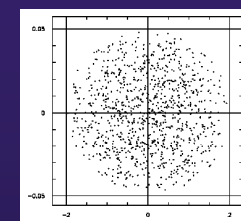
Before passing the accelerator



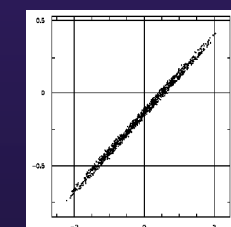
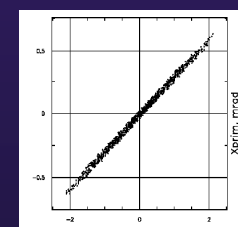
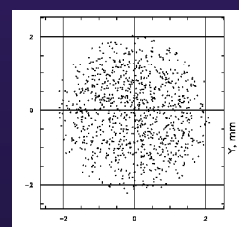
phase plane x-xp



phase plane y-yp



After passing the accelerator



## Electron beam dynamics

Bunch	q [pC]	$\epsilon_0$ [mm·mrad]	$\sigma_z$ [mm]	$\sigma_{x,y}$ [mm]	emittance growth, %
1	77	1	0.6	2	5
2	8	0.1	0.6	0.6	12