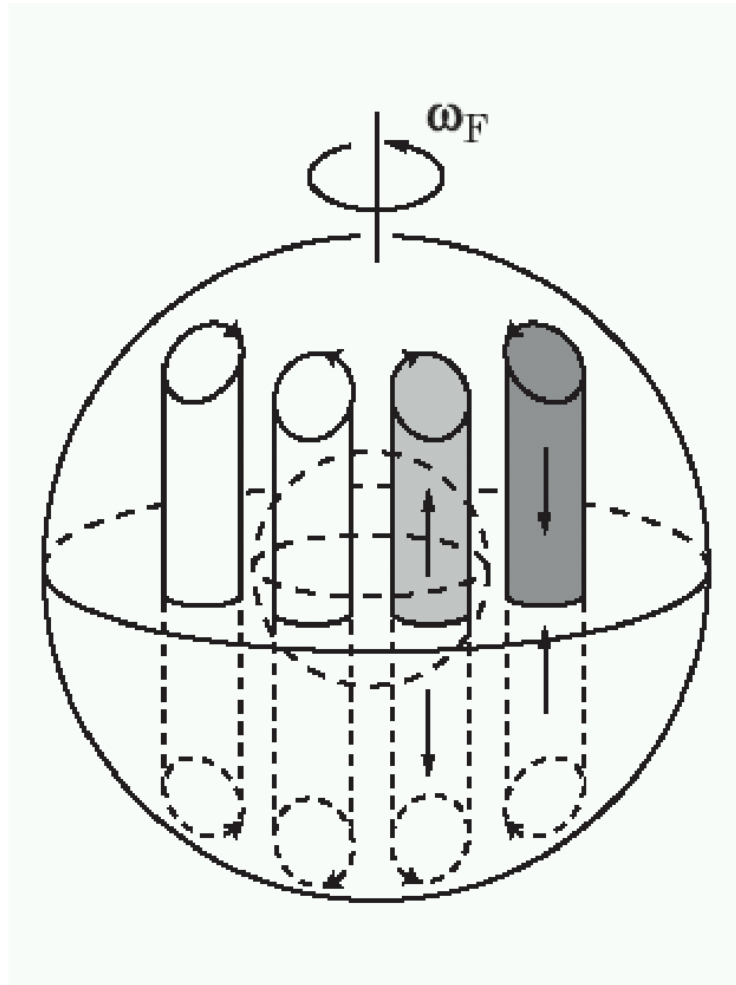
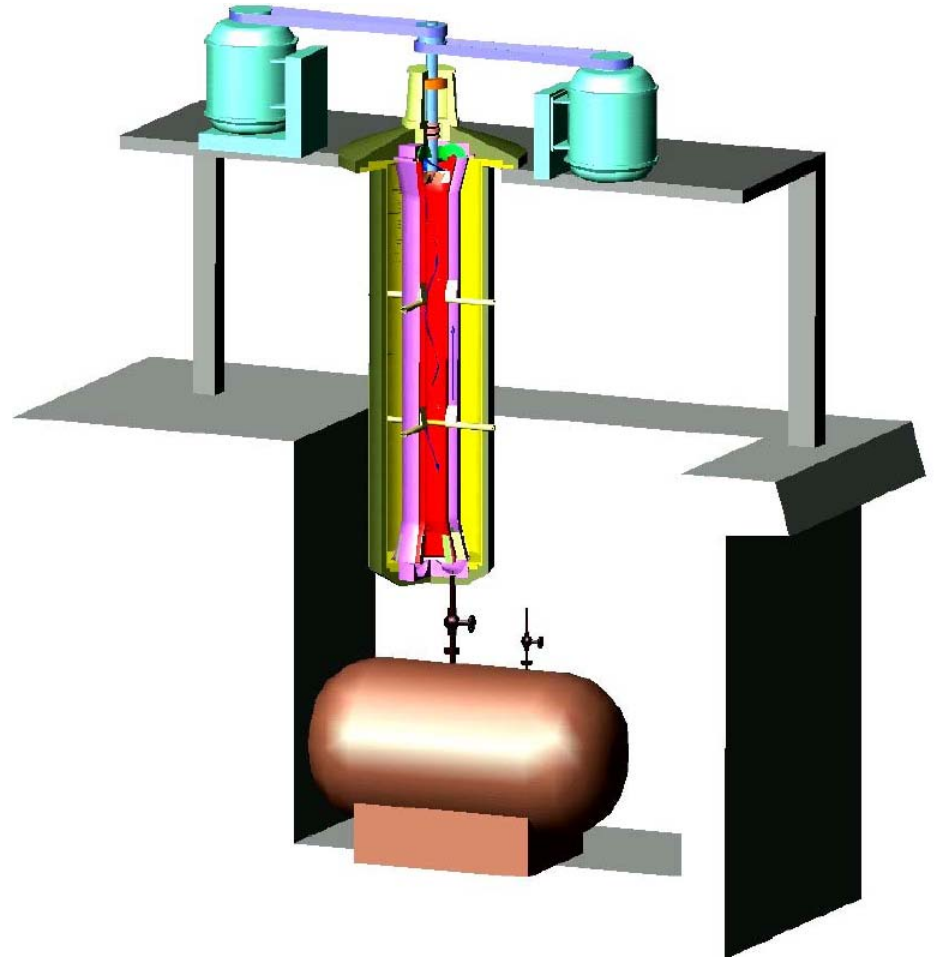
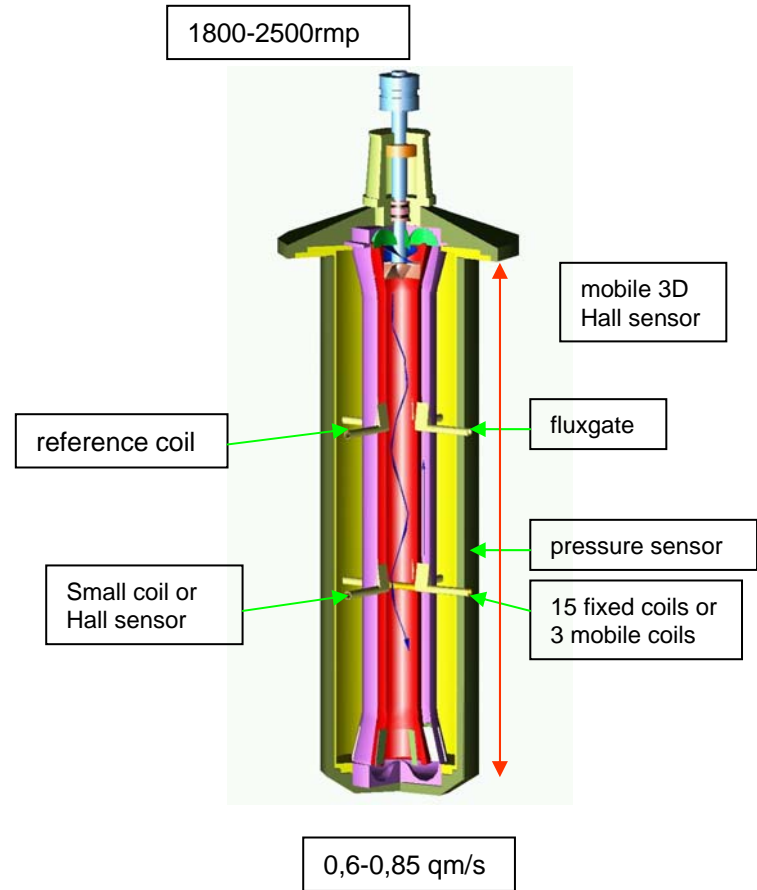
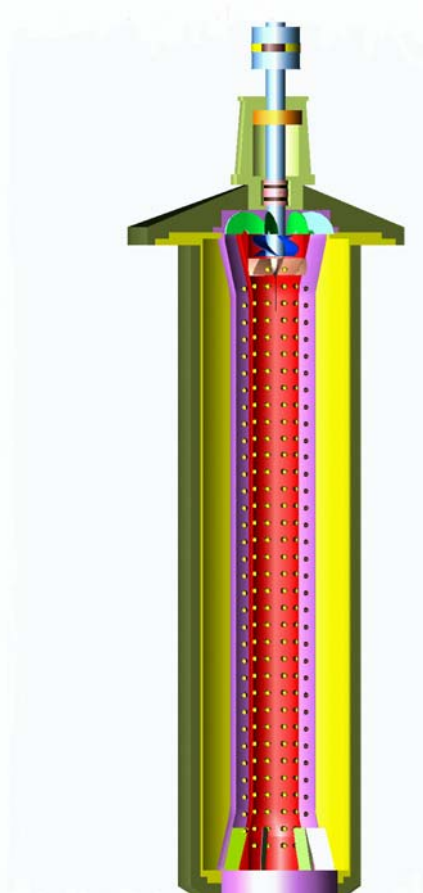
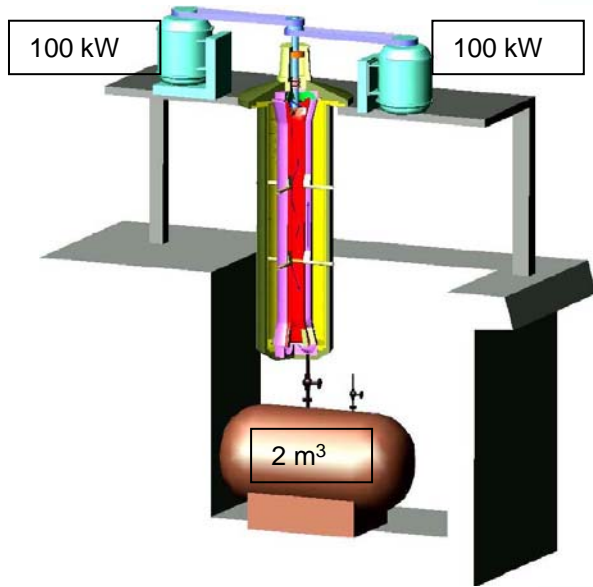

RIGA DYNAMO EXPERIMENT

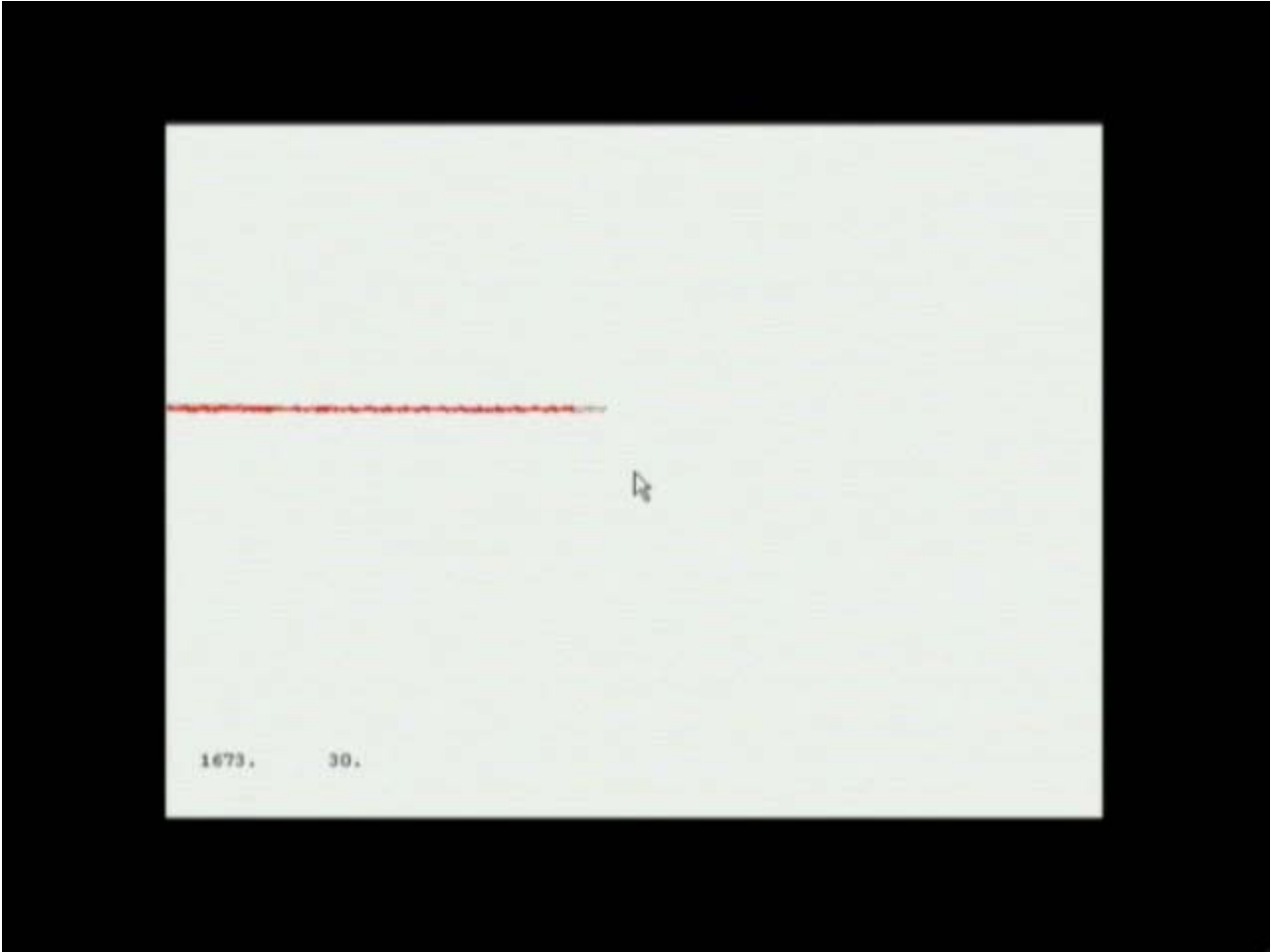
A.Gailitis, O.Lielausis, E.Platacis,
G.Gerbeth & F.Stefani

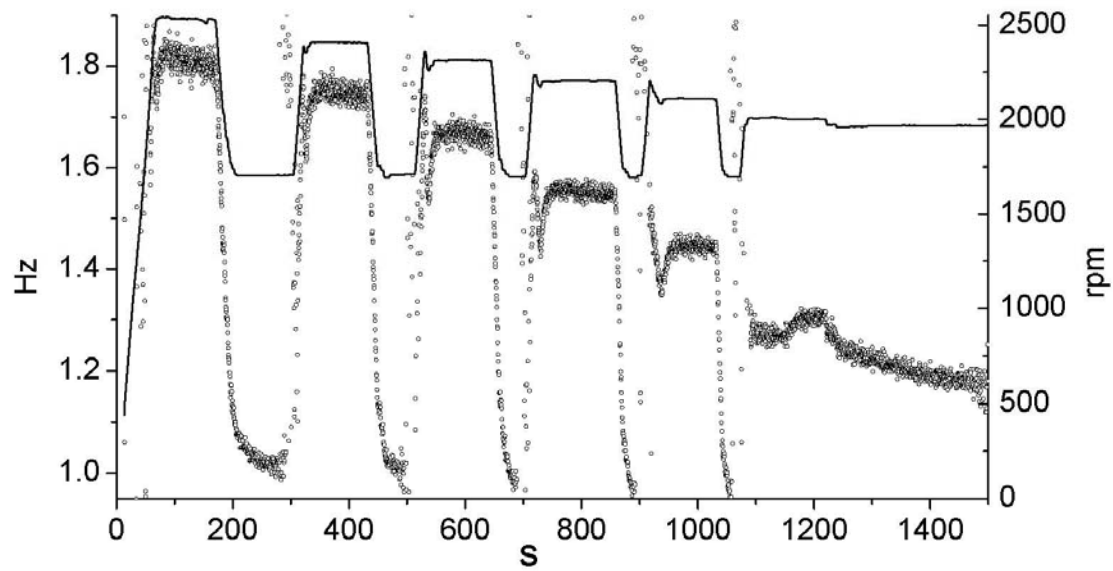
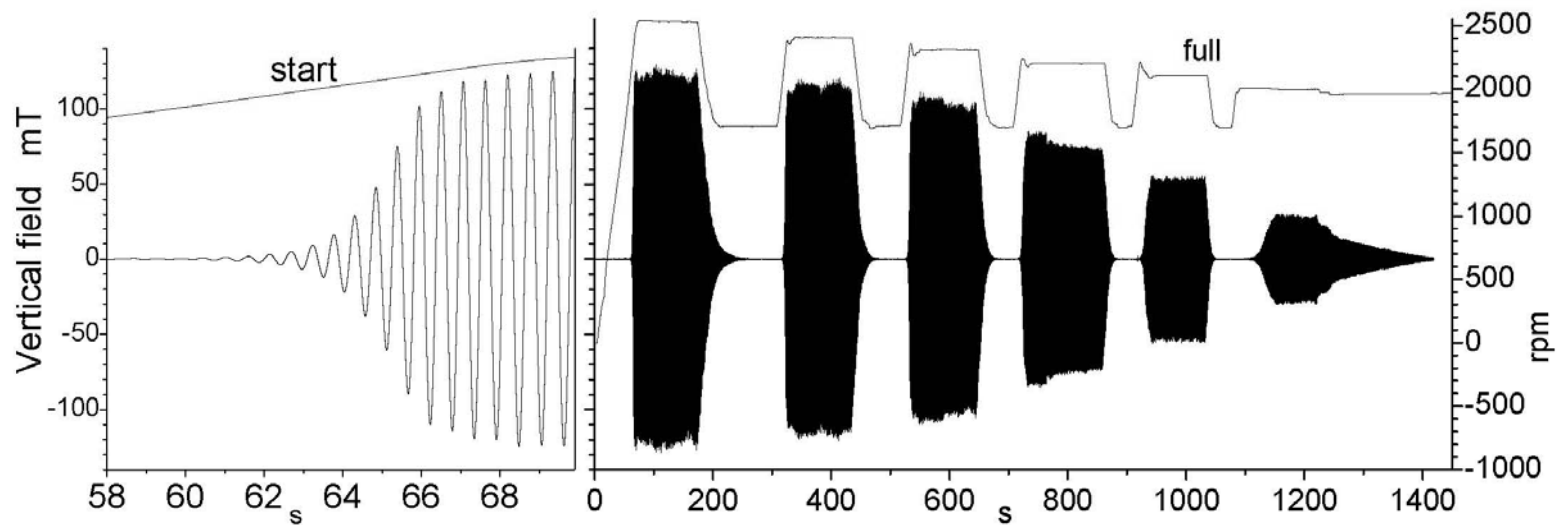


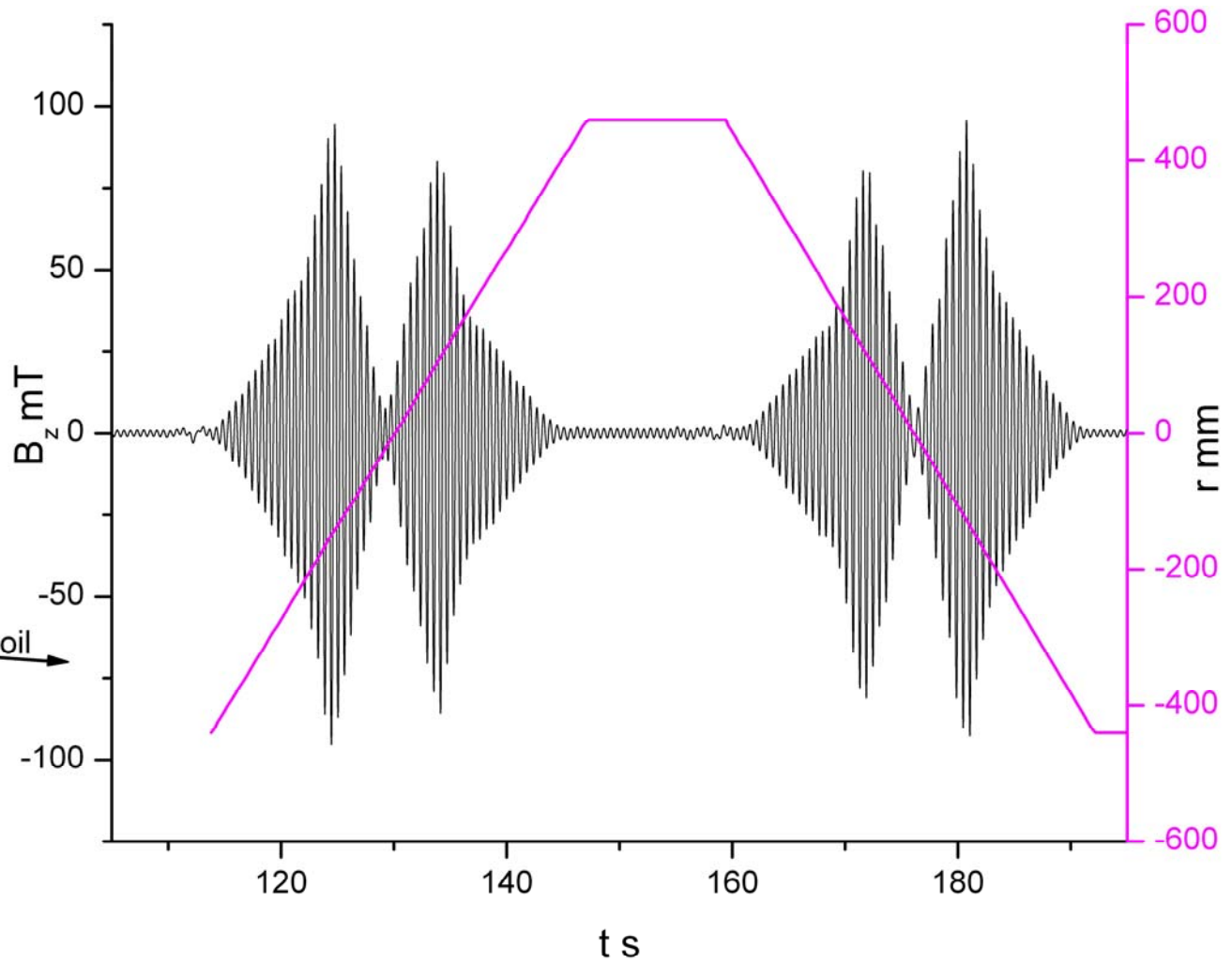
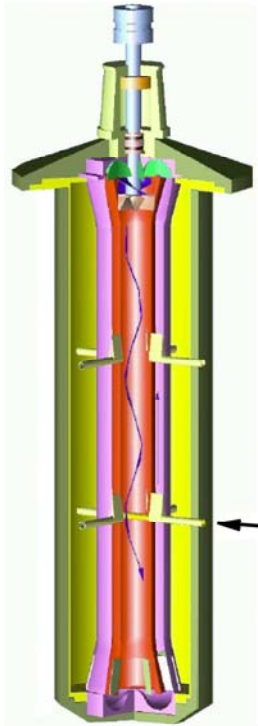
Convection columns in the Earth core.

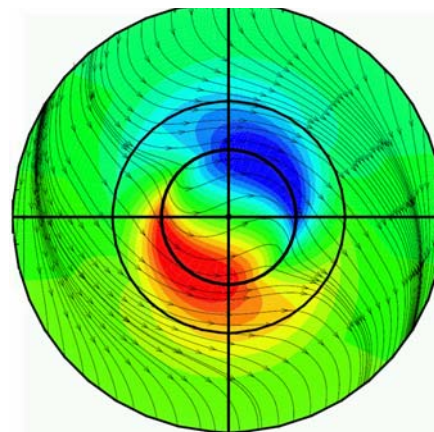
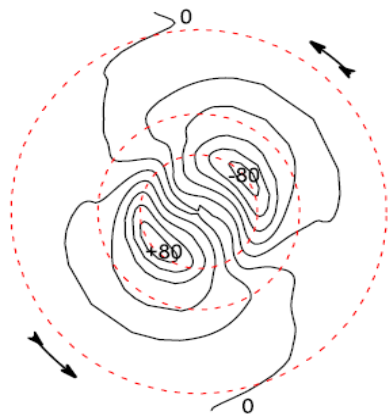
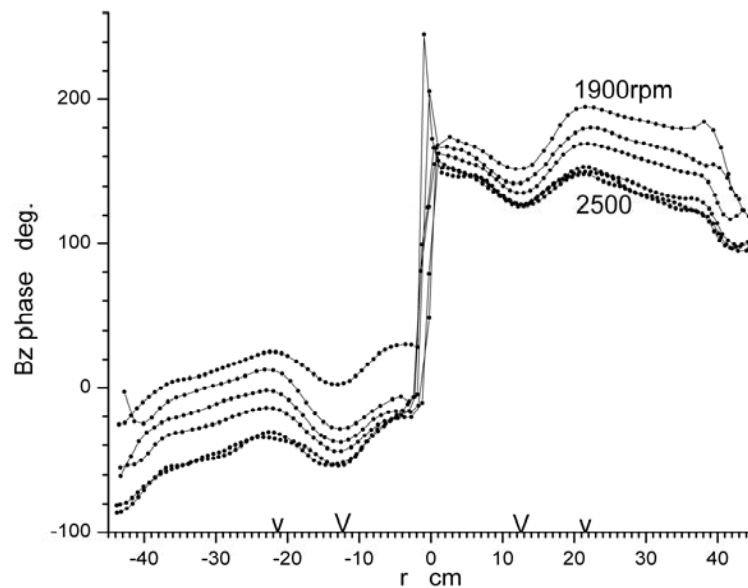
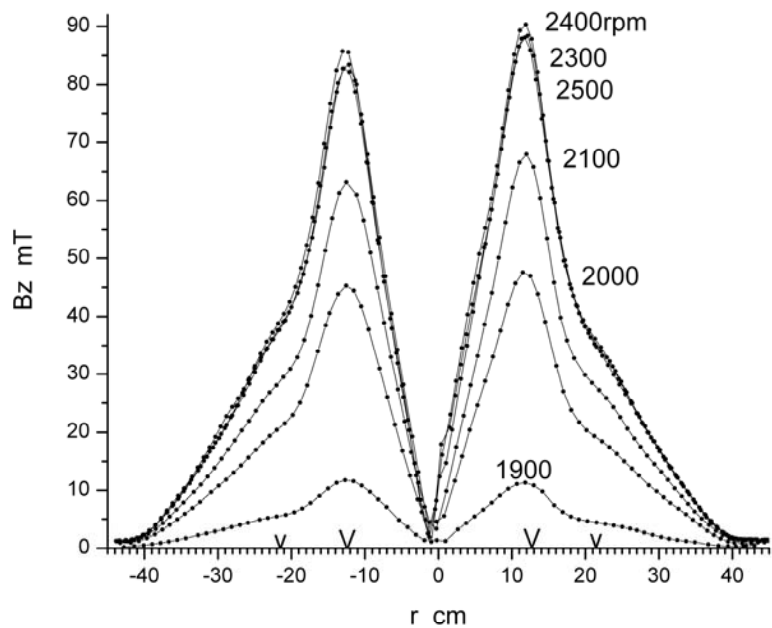




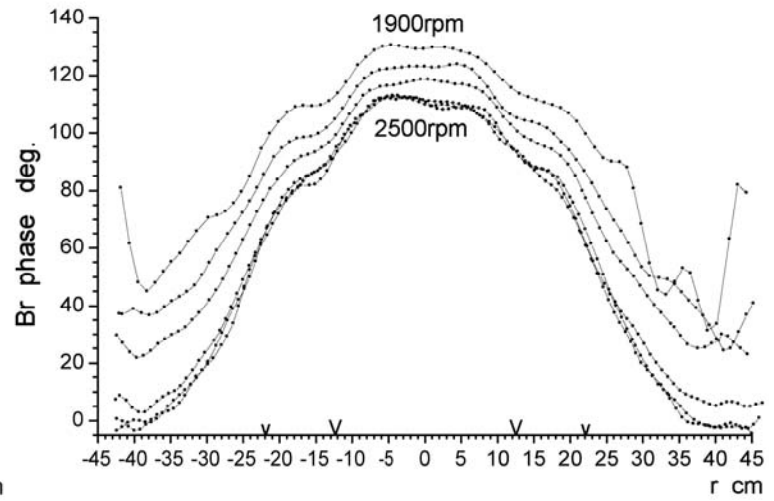
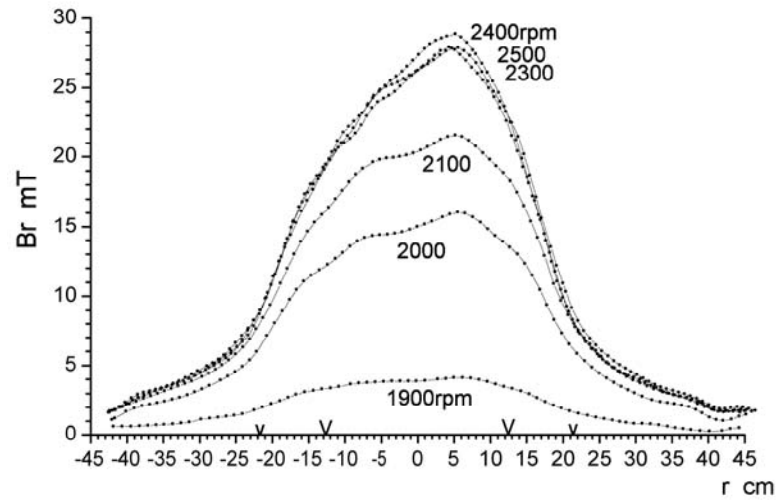
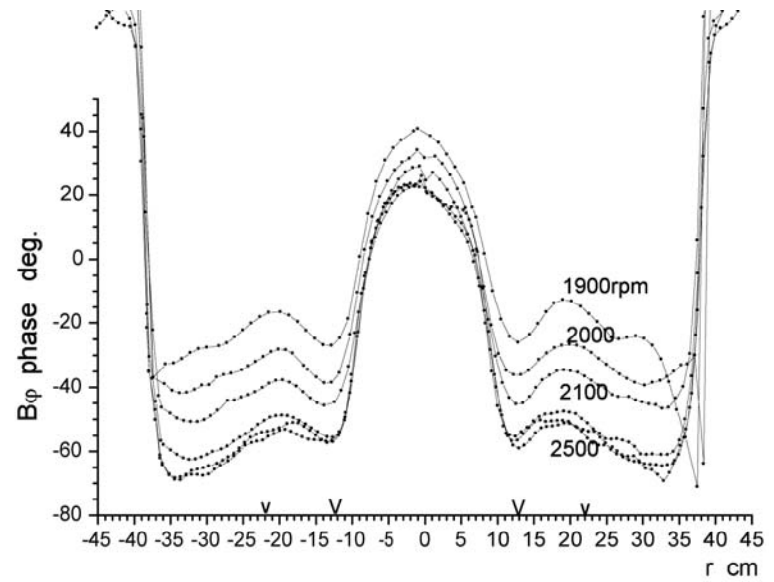
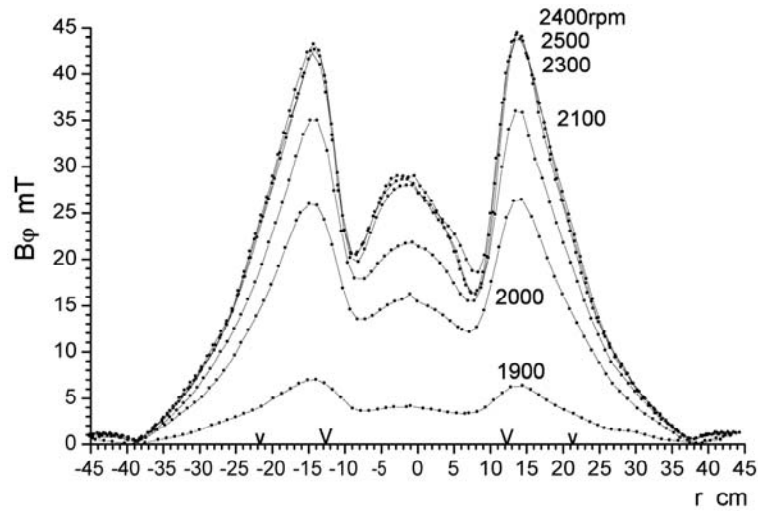








Horizontal field



Energy balance at 2300 rpm:

Unperturbed kinetic energy from
water test:

In direct flow 5000 J/m

In rotation 1300 J/m

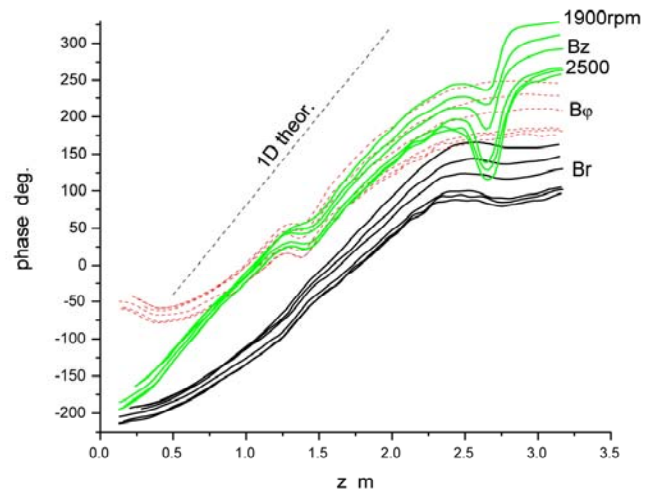
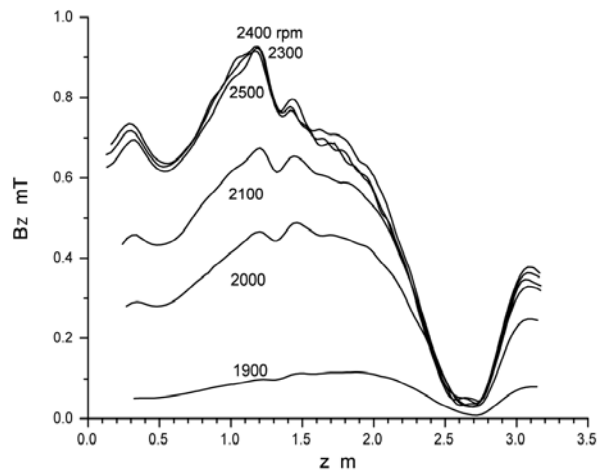
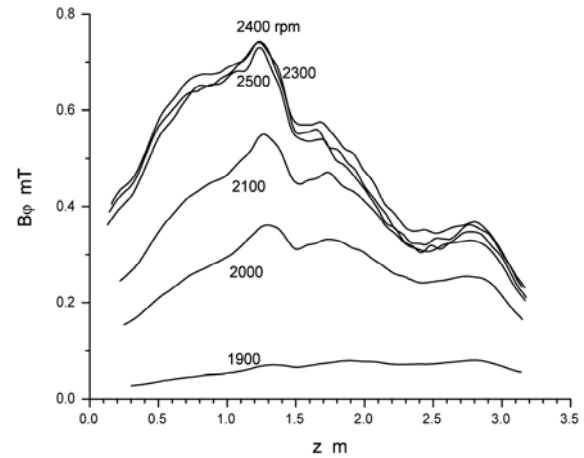
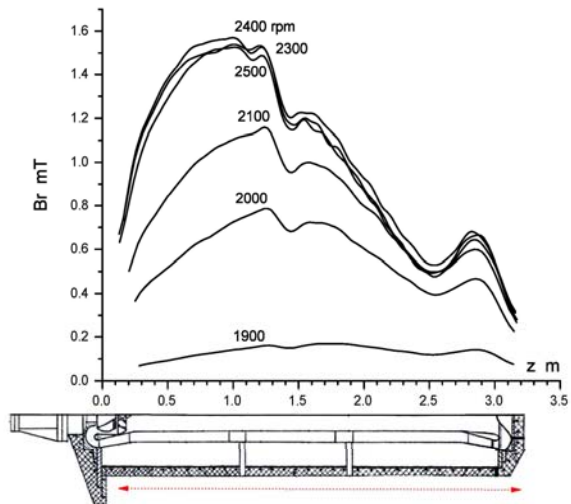
In back flow 2500 J/m

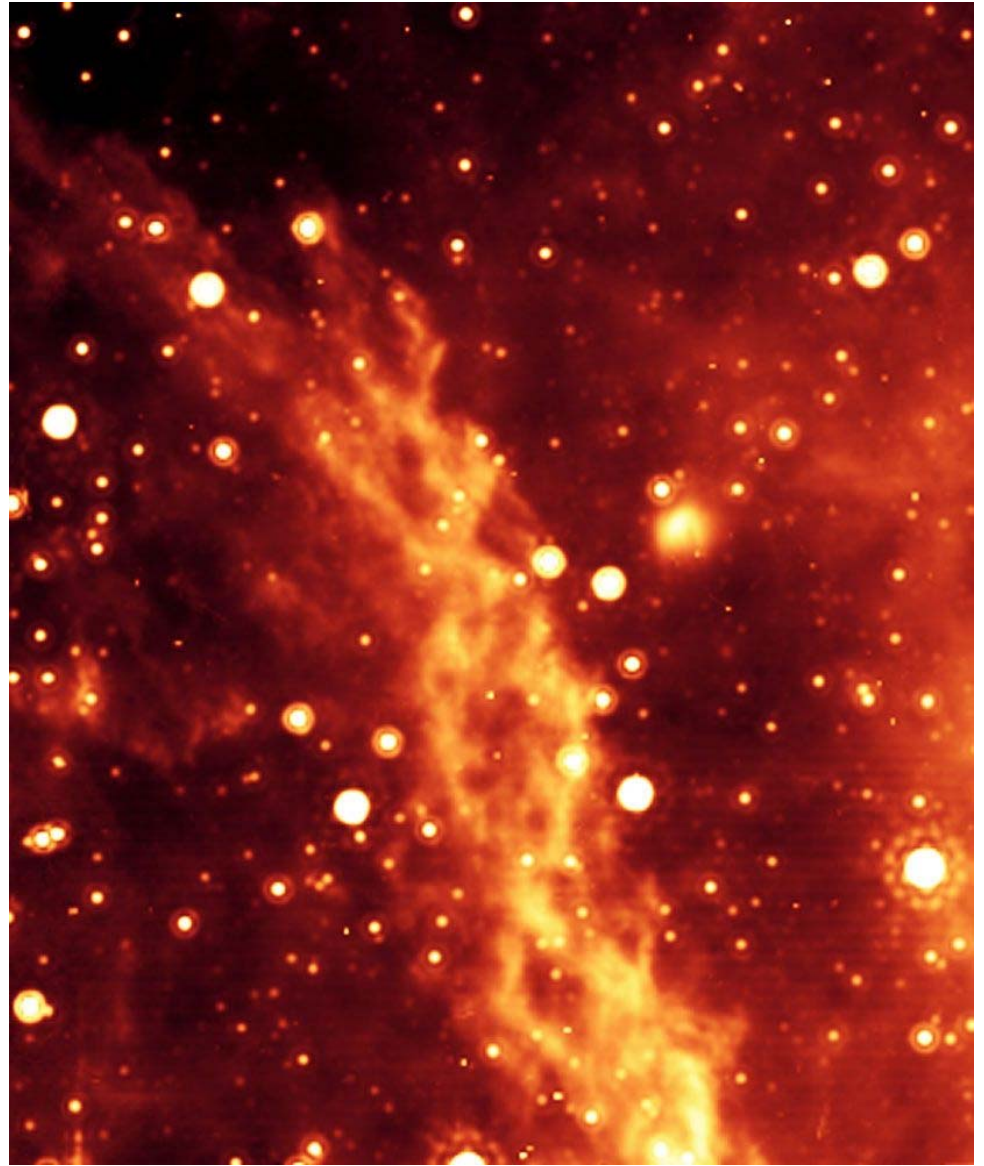
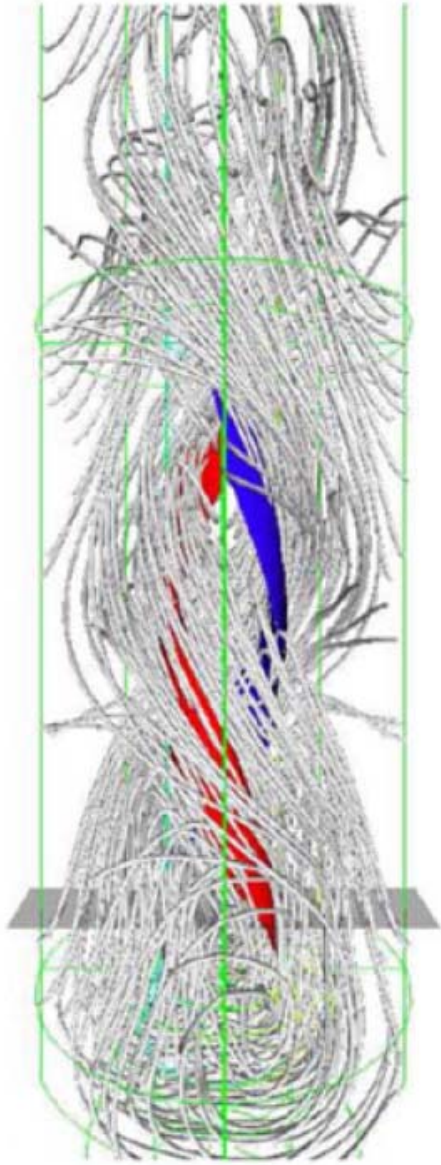
total 8800 J/m

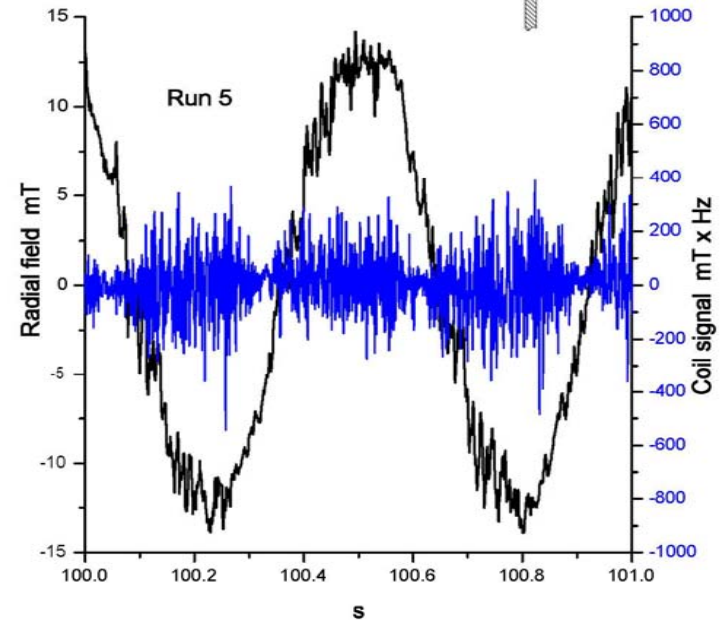
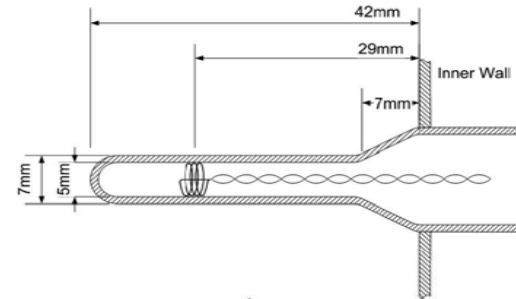
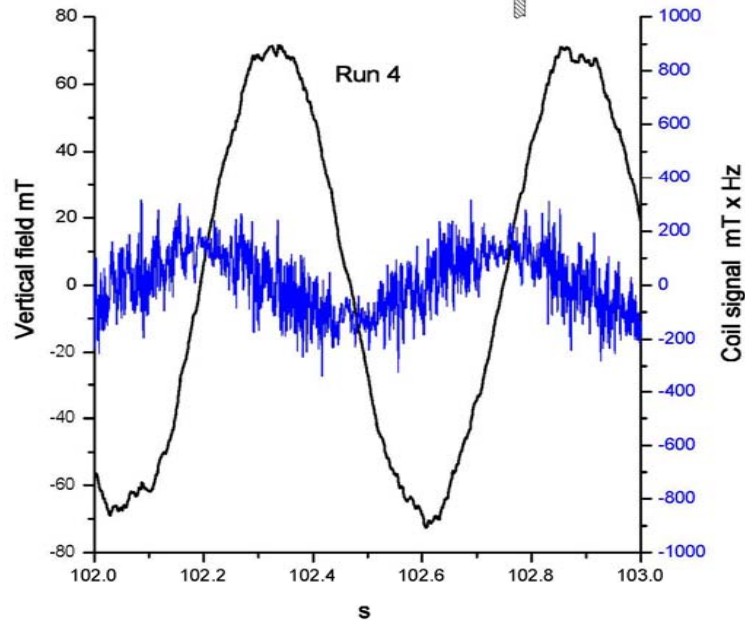
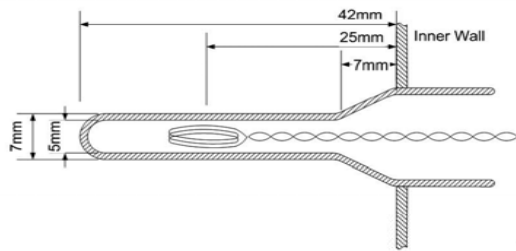
At measured level:

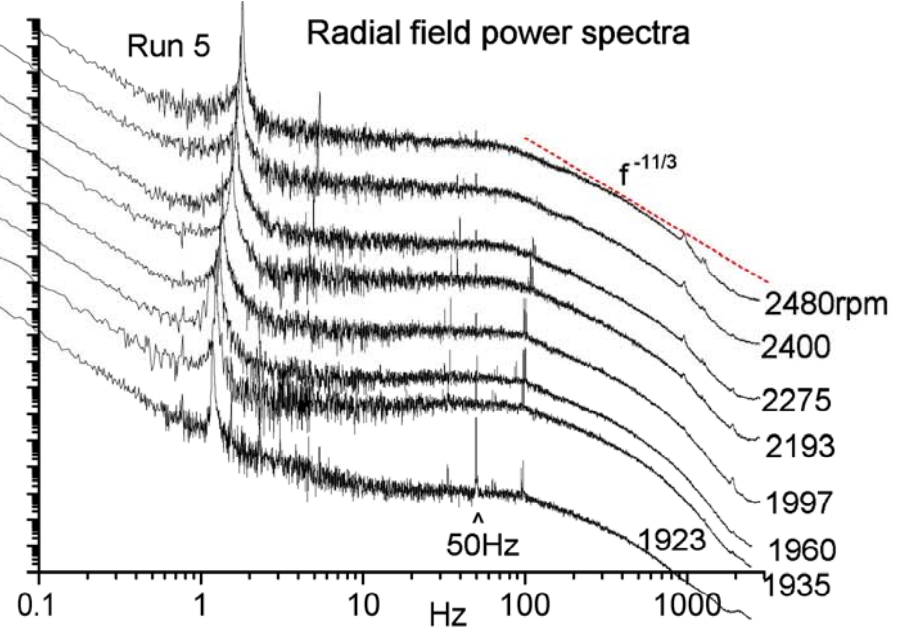
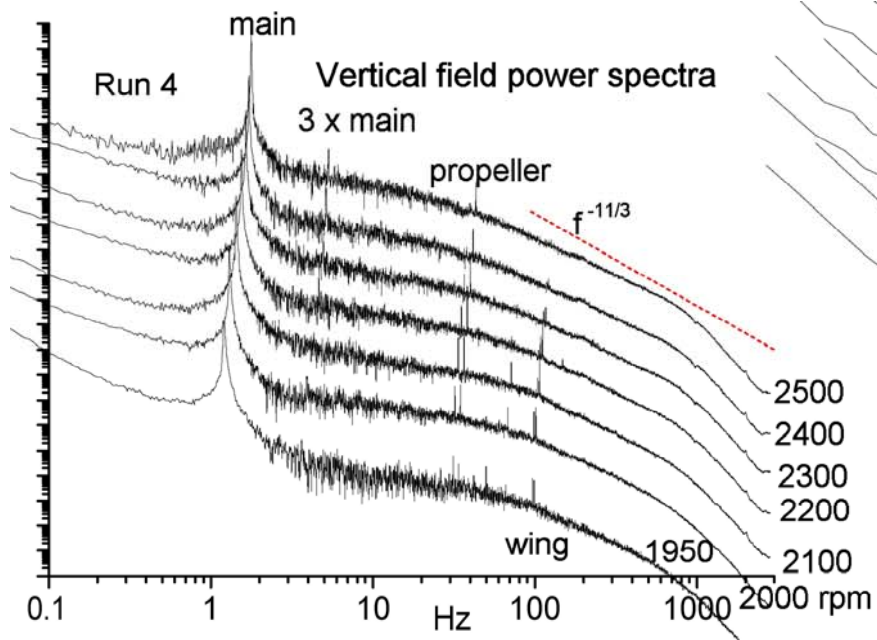
Magnetic energy 175 J/m

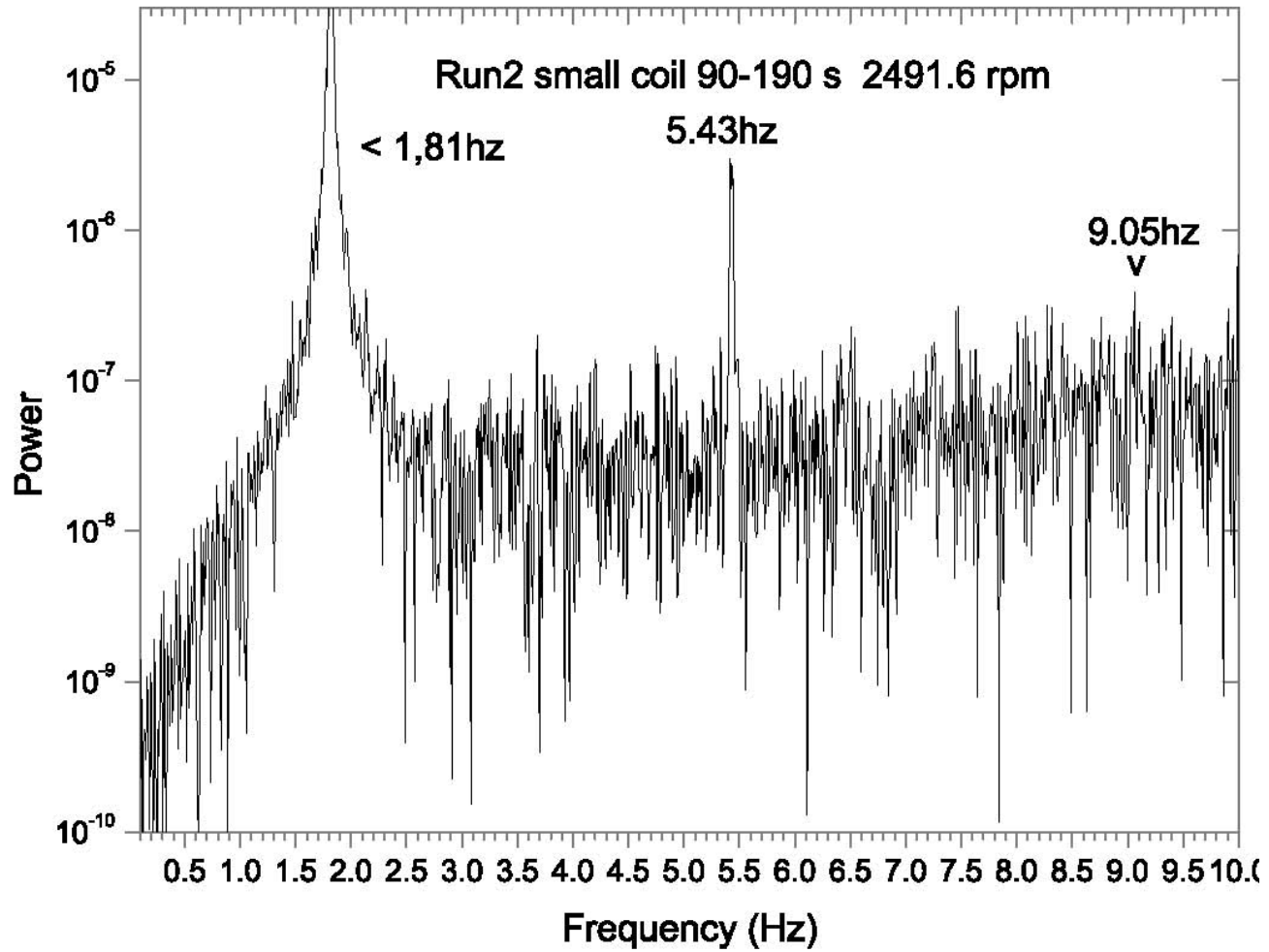
Magnetic/kinetic 2%



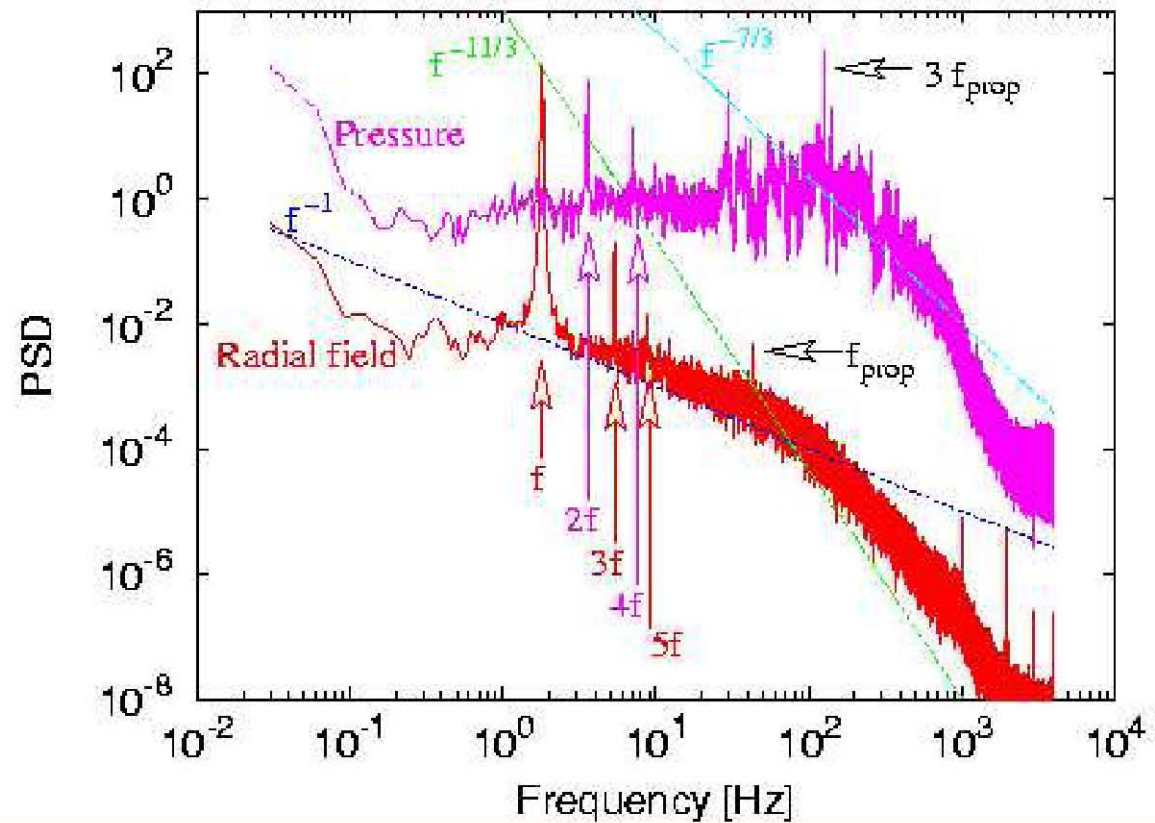


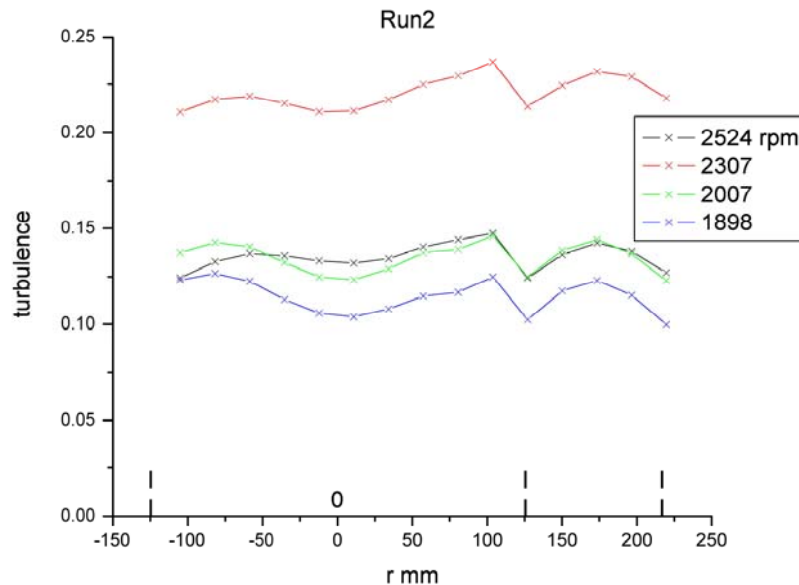






Run 1 - Spectra of radial field (tip) and pressure





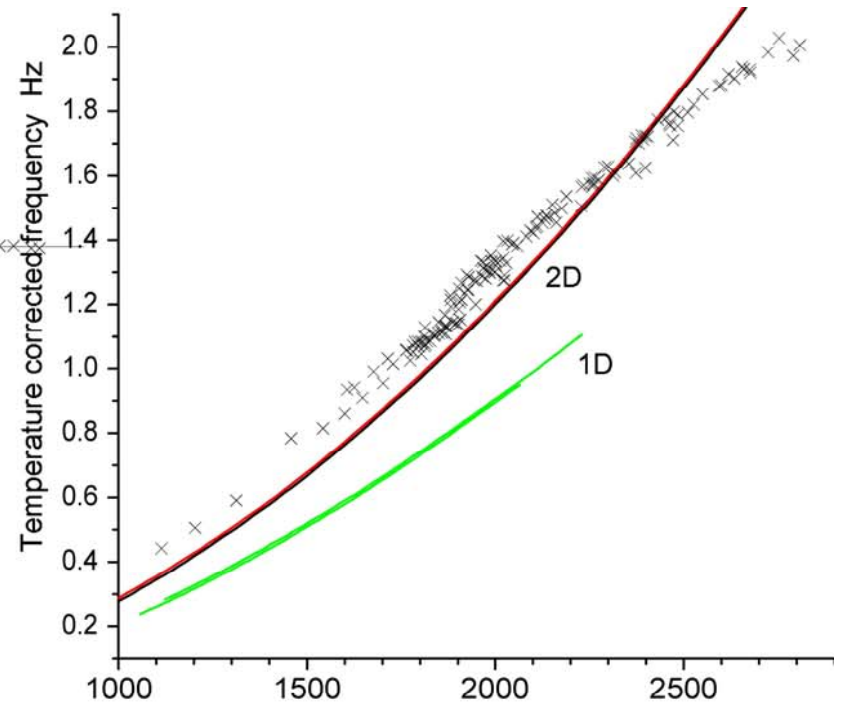
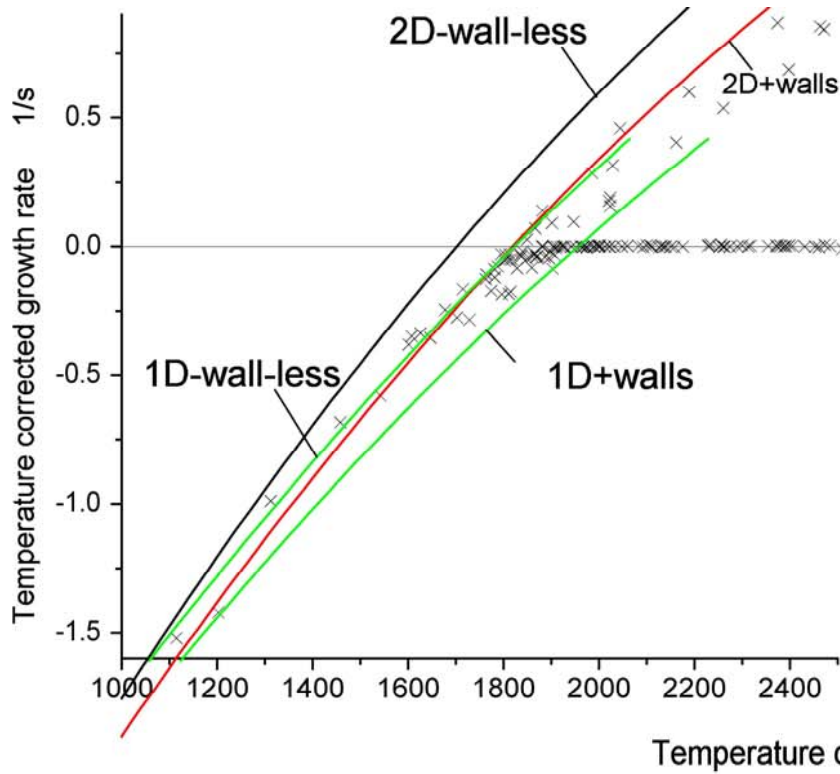
β -- effect:

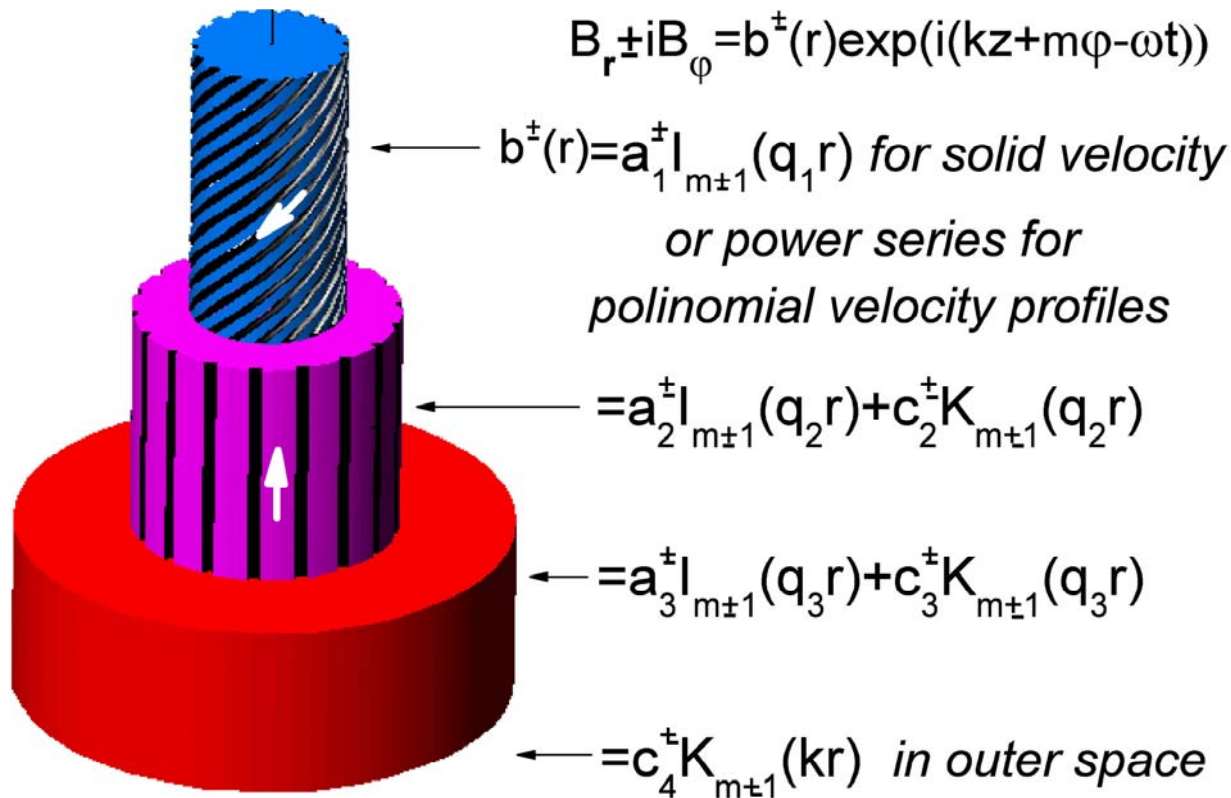
$$\sigma_T = \sigma / (1 + (\mu_0 \sigma v^T \lambda)^2 / 9) \approx$$

$$\approx \sigma / (1 + (B^T / B_0)^2 / 9) \approx$$

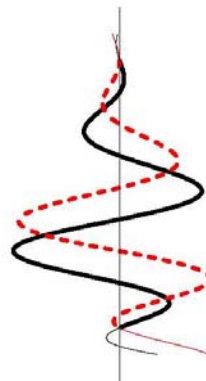
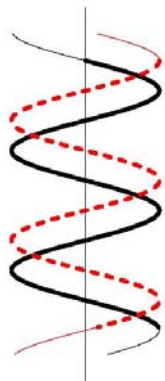
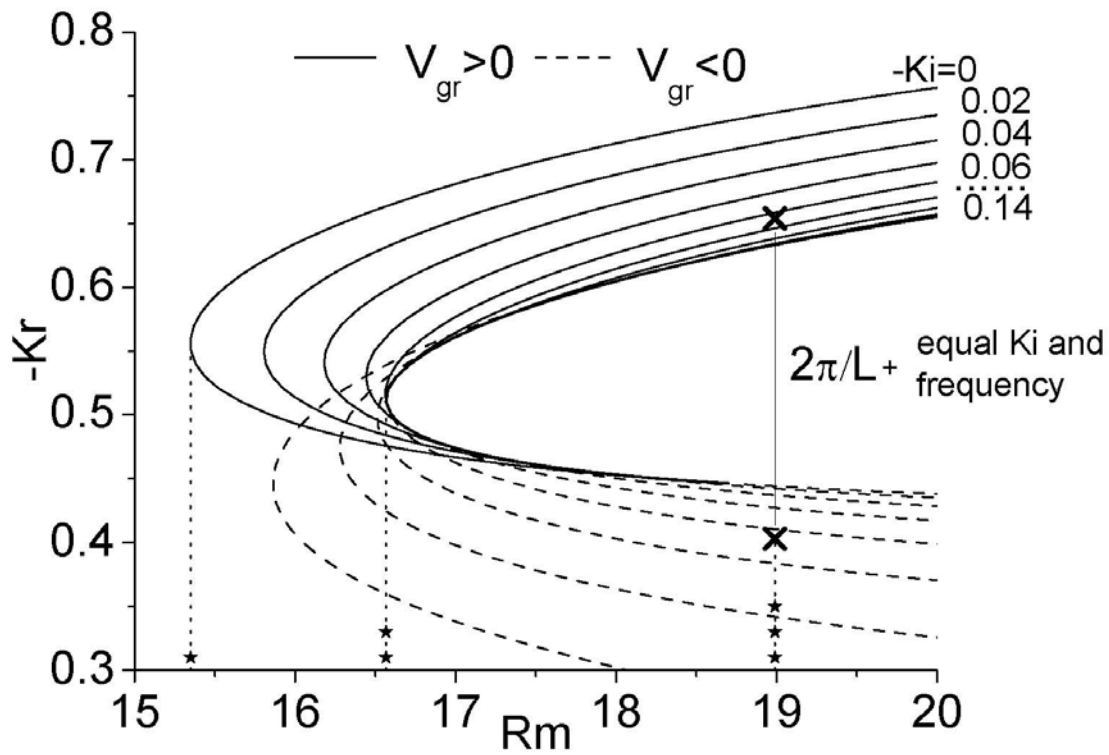
$$\approx \sigma / (1 + (B_r^T / B_r \times B_r / B_z)^2 / 3) \approx$$

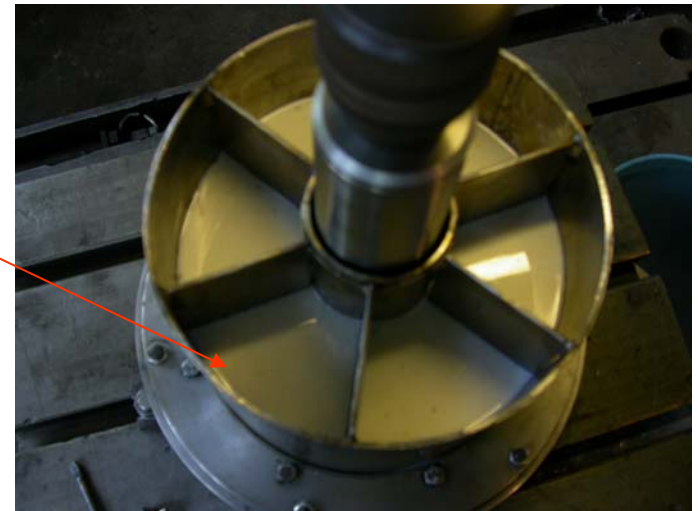
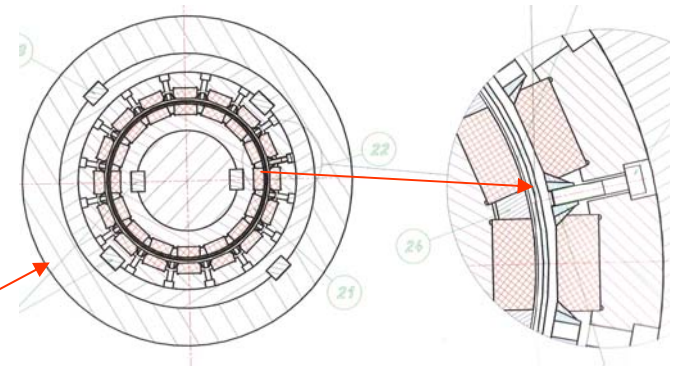
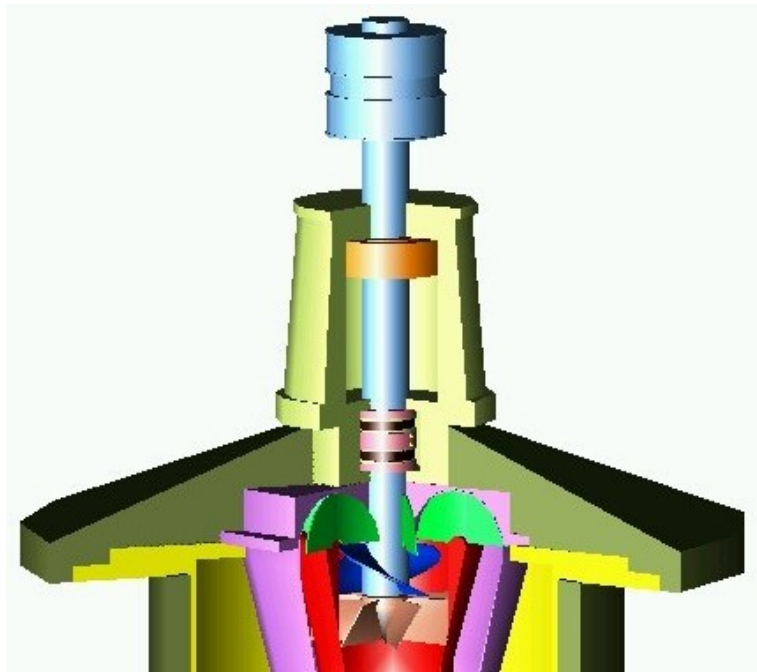
$$\approx \sigma / (1 + (0.15/3)^2 / 3) \approx 0.999\sigma$$





$$q_n^2 = k^2 + i\mu_0 \sigma \omega_n \quad \omega_n \text{-frequency in co-moving frame}$$







END