[50] *Gravitational waves from Q-balls in gravity mediation*
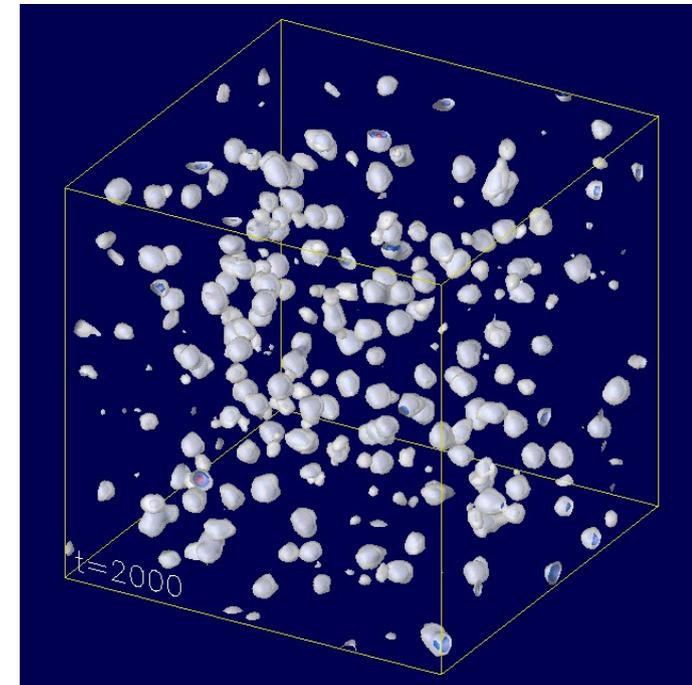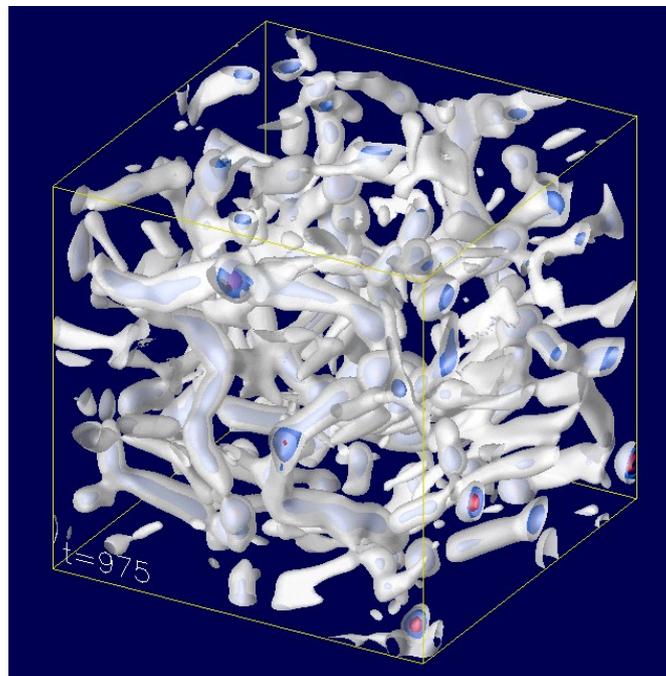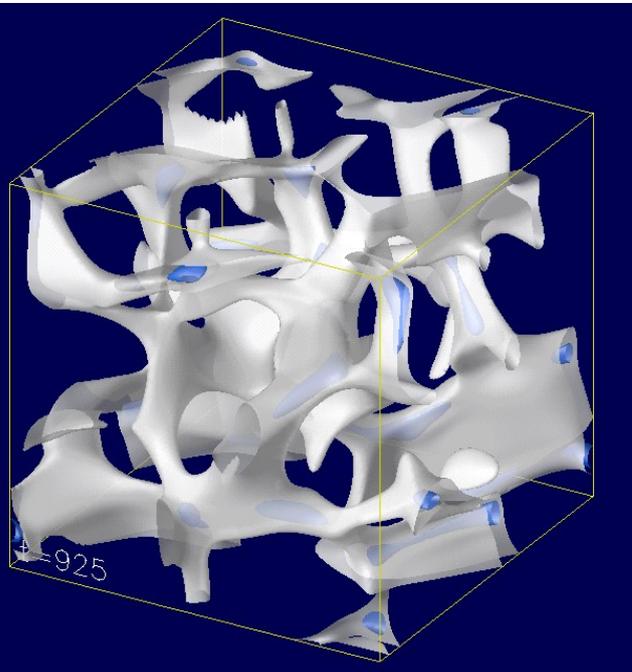
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COLLABORATION WITH

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Masahide Yamaguchi (TITech)

TH, Takahashi, Yamaguchi, in preparation

3D numerical simulation of AD field dynamics
- Q-ball formation in gravity mediation
- Calculating energy spectrum of gravitational waves

$$\Box h_{ij} \sim \frac{1}{a^2} Re(\partial_i \Phi \partial_j \Phi^*) \qquad \rho_{\mathrm{GW}} = \frac{1}{32\pi G}\langle \dot{h}_{ij}\dot{h}_{ij}\rangle \qquad \Omega_{\mathrm{GW}} = \frac{1}{\rho_c}\frac{d\rho_{\mathrm{GW}}}{d\log k}$$

$N = 200^3$

$\varepsilon = 1$

$Lm = 1$

$mt = 900$

GWs produced by the growth of filamentary structure

GWs produced by fragmentation

Q-ball size $k_Q \sim \sqrt{|K|}m \sim 0.3m$

$\Omega_{\mathrm{GW}}(|\Phi_{in}|/M_{pl})^{-4}$

k_{phys}/m