1165-35-45 **Carlos Kenig** and **Jiuyi Zhu*** (zhu@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70810, and **Jinping Zhuge**. *Three-ball inequalities, doubling inequalities and nodal sets estimates in periodic elliptic homogenization.* Preliminary report.

We consider a family of second order elliptic operators in divergence form with rapidly oscillating and periodic coefficients. We are able to show an approximate three-ball inequality using a representation of the solution by the Poisson kernel and the Lagrange interpolation technique. We can also obtain quantitative explicit doubling inequalities, which are derived by the combination of convergence rate estimates, three-ball inequalities from large-scale analyticity, and the monotonicity formula of frequency function. Furthermore, the explicit upper bounds of nodal sets are shown using doubling inequalities, approximation of harmonic functions and iteration arguments. The work is jointly with Carlos Kenig and Jinping Zhuge. (Received January 10, 2021)