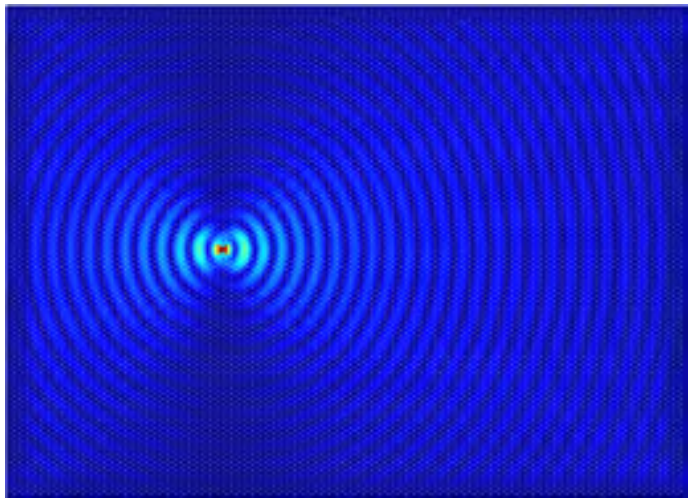
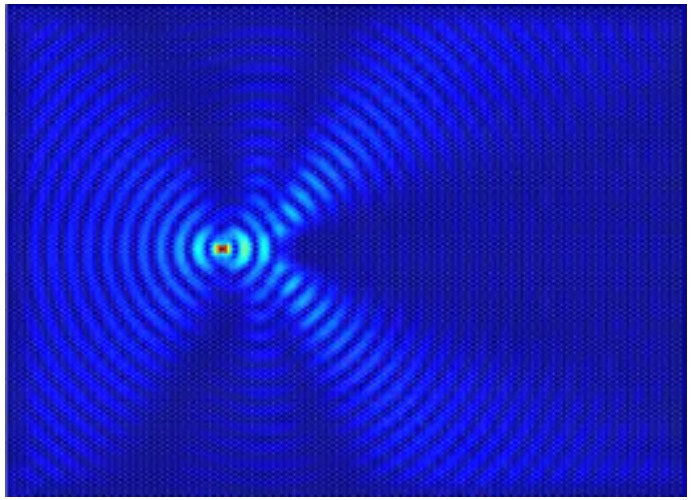
Gyro-elastic lattice cloak (continued)

Applications of gyro-elastic lattices: Cloaking (continued)

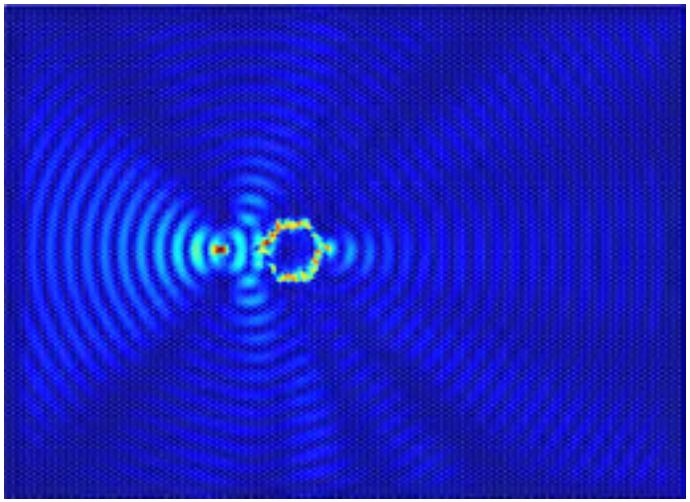
Homogeneous lattice



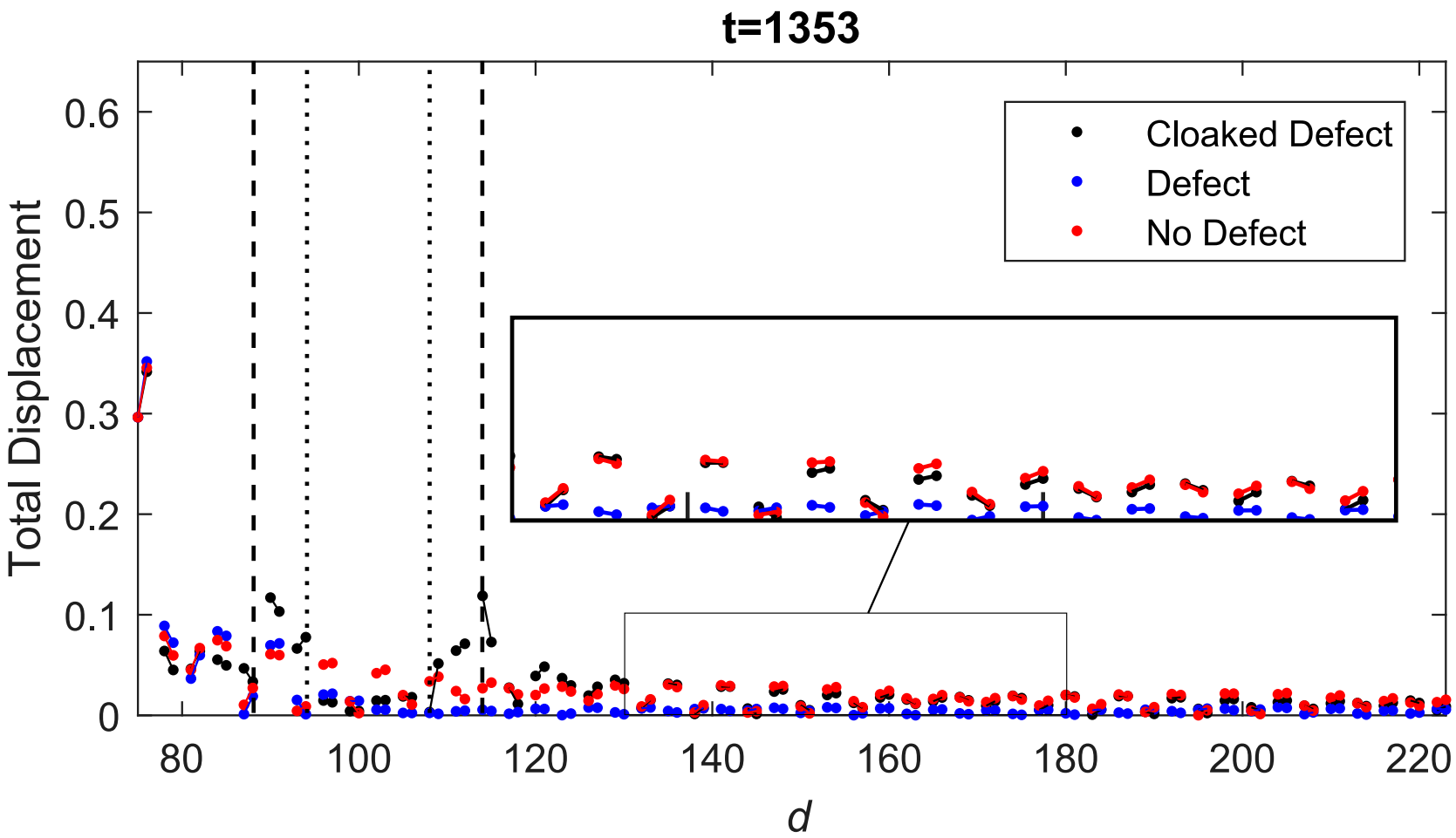
Lattice with hexagonal defect



Defect with gyro-elastic cloak



Quality of the cloak along a line in the hexagonal lattice



Quality of the cloak along a line in the hexagonal lattice (continued)

Conclusions

1. The analysis of an array of gyroscopic spinners interacting with several trusses has been carried out, and a new-type of model has been introduced describing this in the transient regime.

2. A modal analysis of the system has been carried out and used to predict the motion of the system in the transient regime.

3. The theoretical model agrees well with predictions based on independent finite element computations.

4. Several special dynamic phenomena such as highly localised waves and interfacial waveforms have been analysed in the transient regime.

5. The model has been used to create two novel applications in the design of an efficient topological insulator and a discrete gyro-elastic cloak for an hexagonal lattice.

6. The models characterising the interaction of between gyroscopic and elastic elements can potentially introduce new pathways for the design of new metamaterials and waveguides.