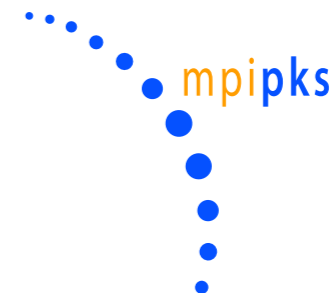


Some recent ED (& MC) results for Kagome lattices

Andreas Läuchli

“New States of Quantum Matter”

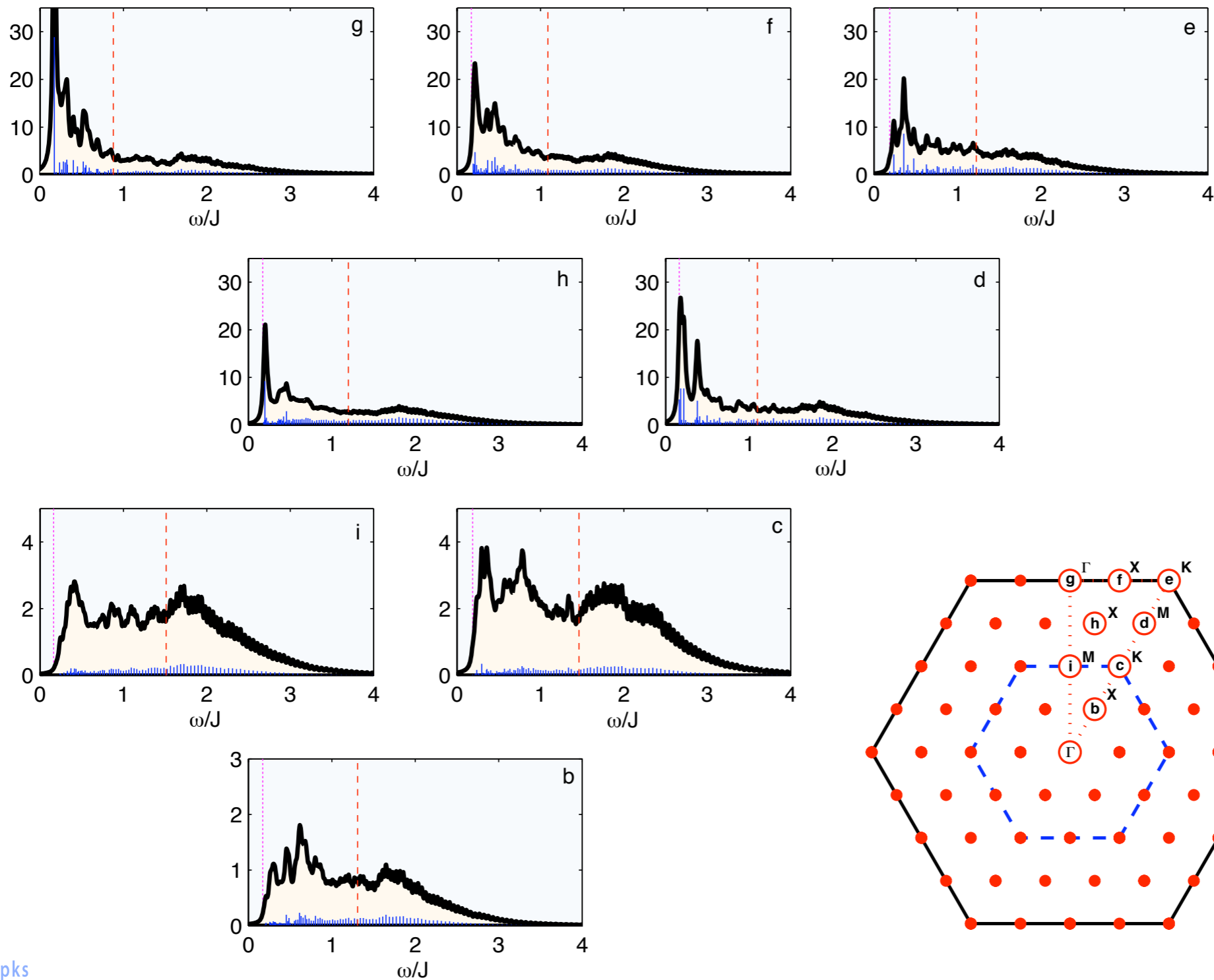
Max Planck Institut für Physik komplexer Systeme - Dresden



In collaboration with C. Lhuillier, J. Sudan, E. Bergholtz and R. Moessner



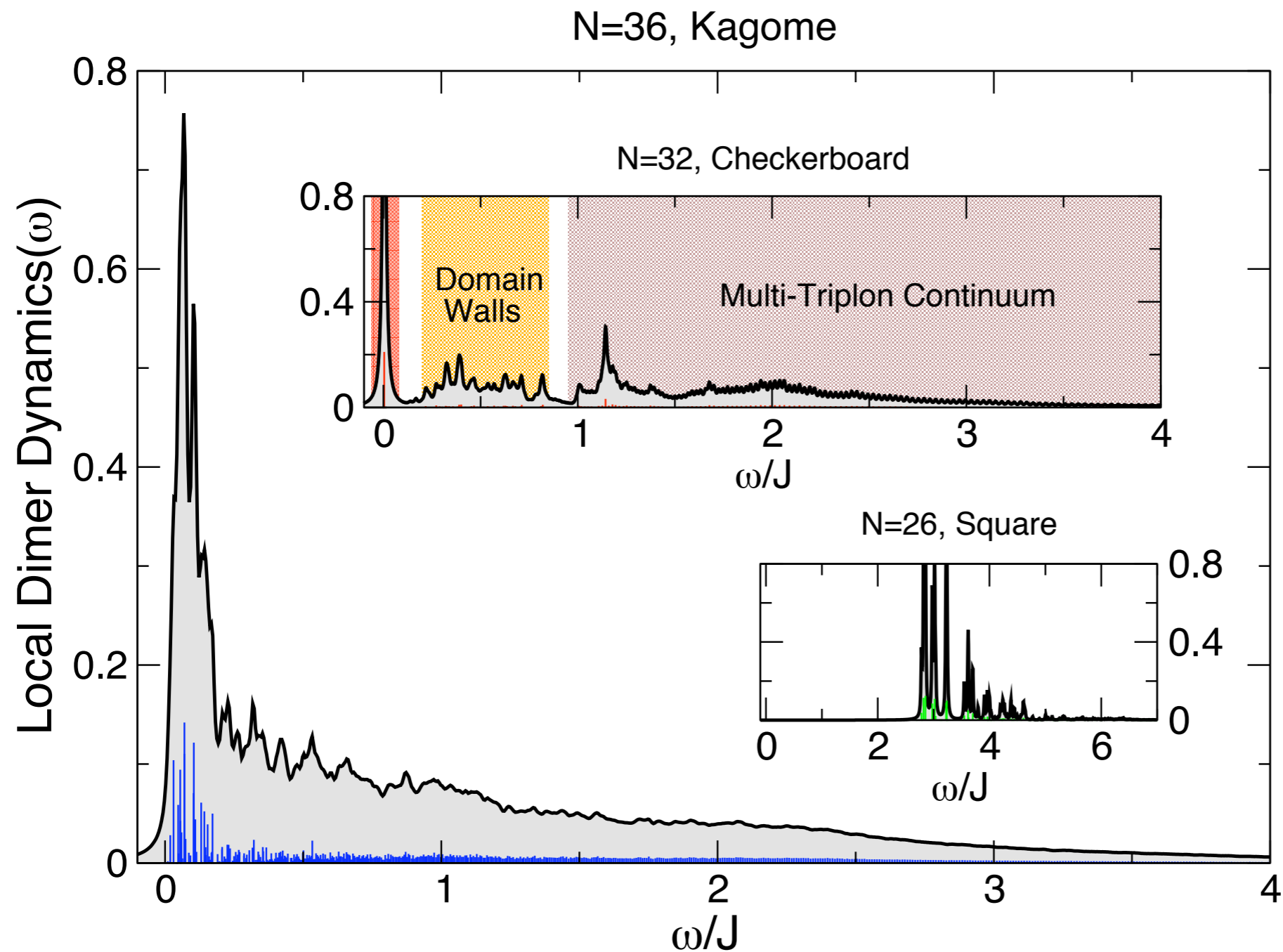
Dynamical Spin Structure Factor (\sim INS)



- Broad response in energy
- Spiky features at lowest energies, Remnant of VBC?
- Relation to INS experiments on Herbertsmithite ?
[Lee et al '07,](#)
[Helton et al. '07,](#)
[deVries et al, '09](#)

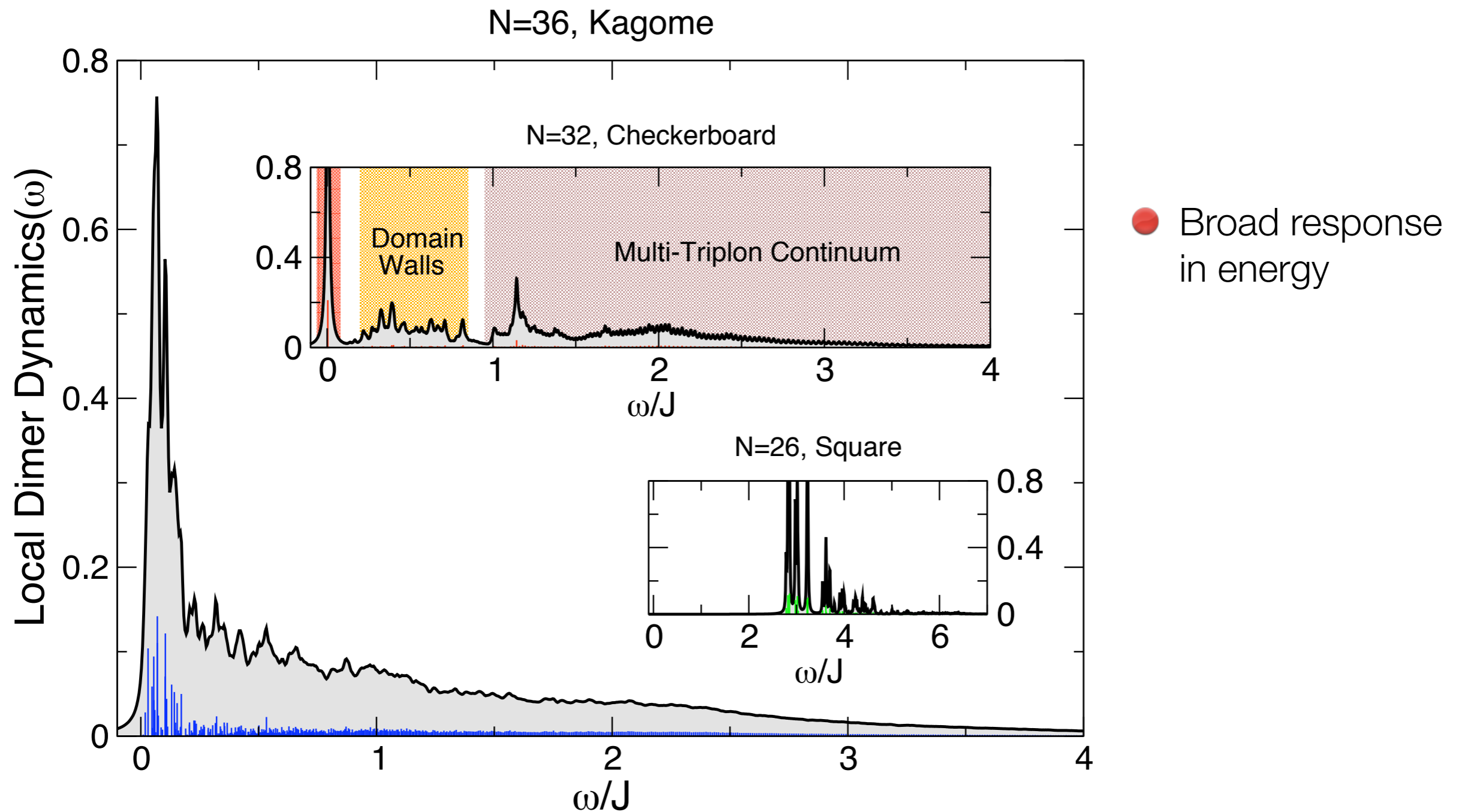


Local Dimer Autocorrelations (\sim Raman)



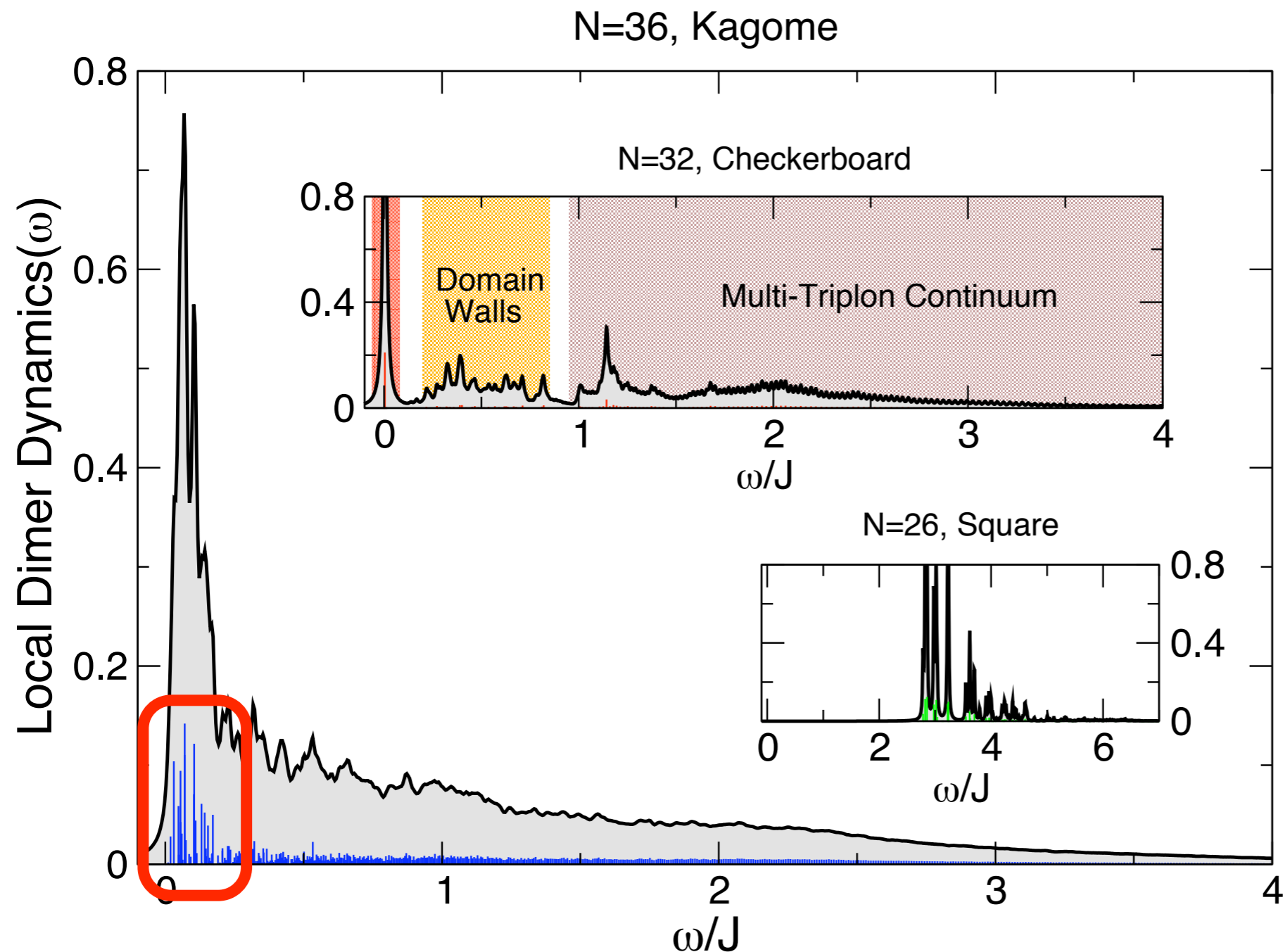


Local Dimer Autocorrelations (\sim Raman)





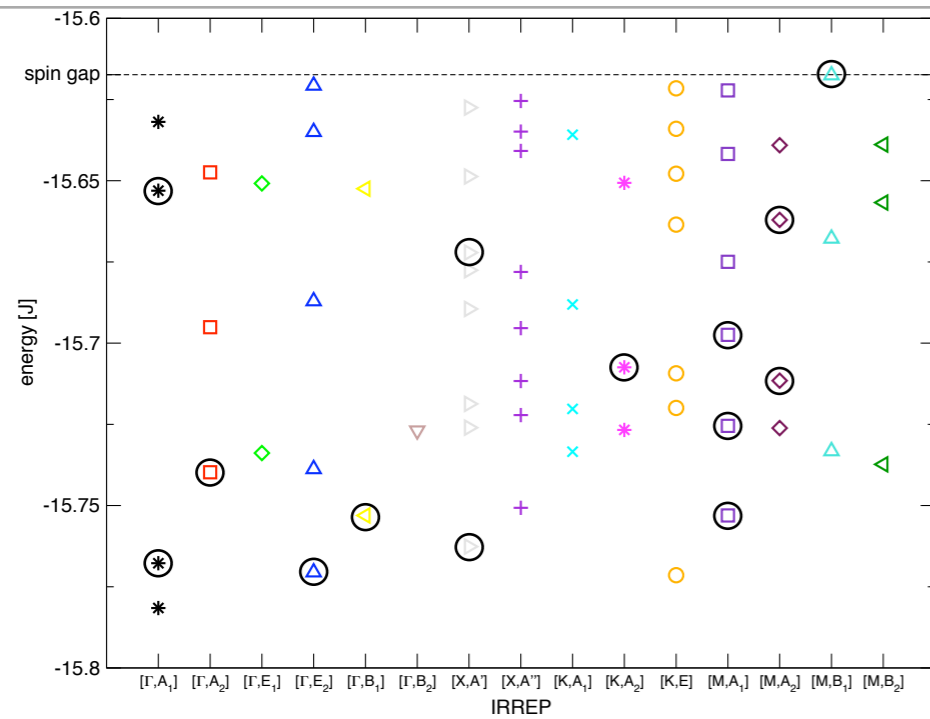
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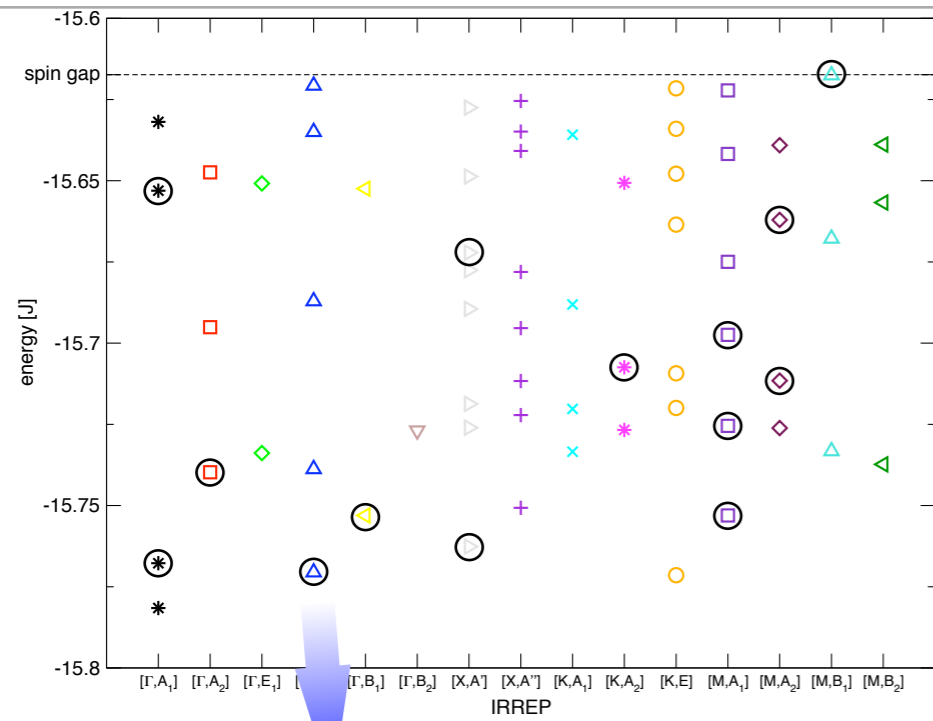


Dimer correlations of low lying singlets (N=36)

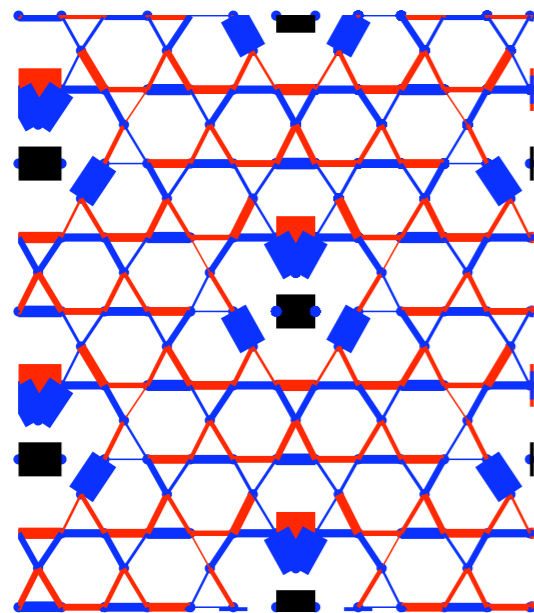




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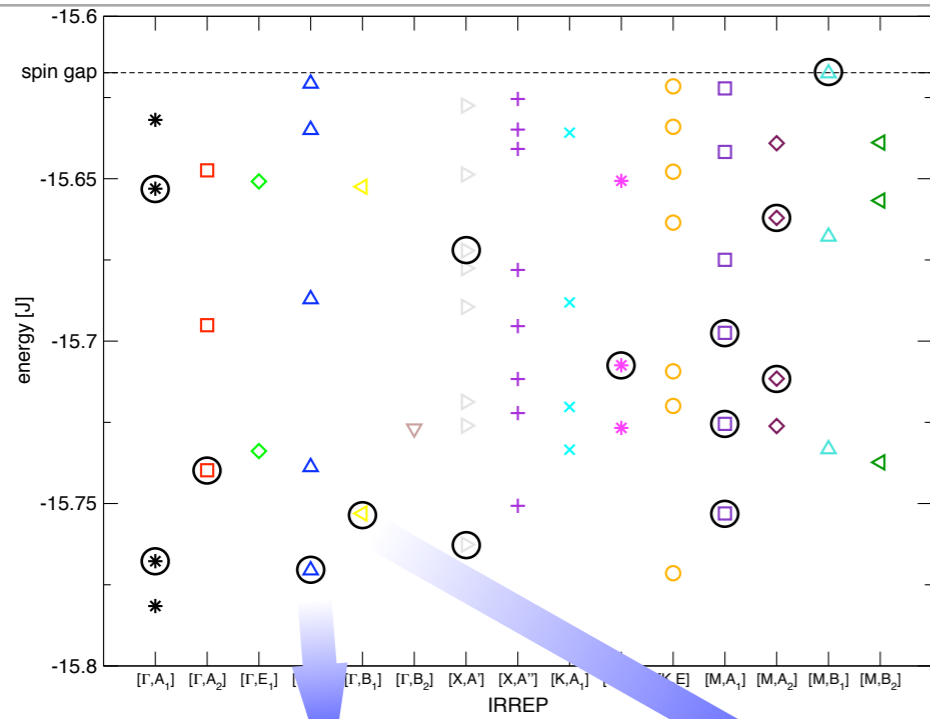


$[\Gamma, E_2], \text{level 1}$

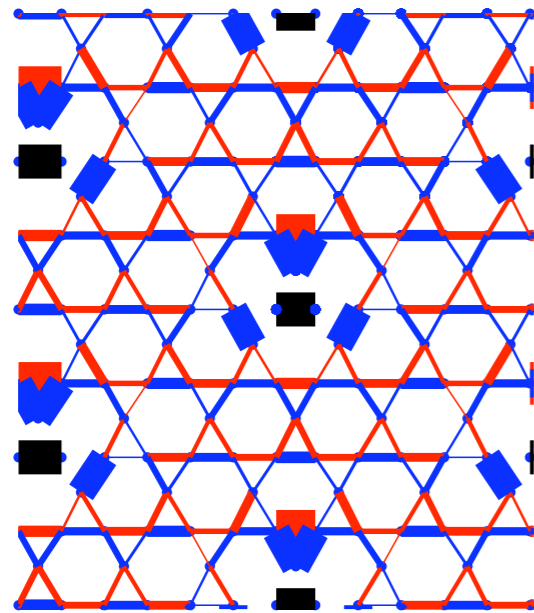




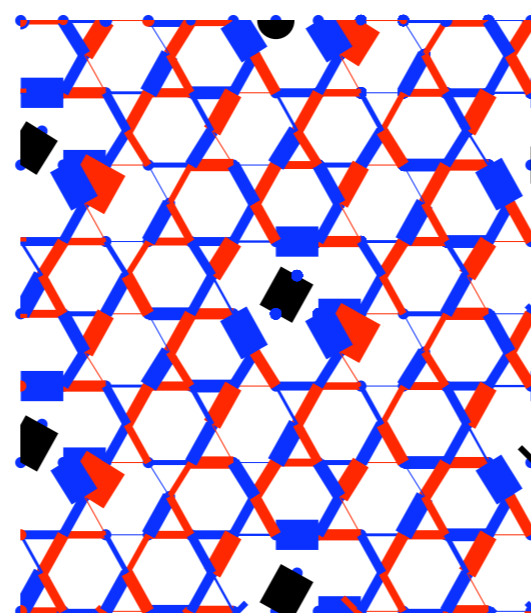
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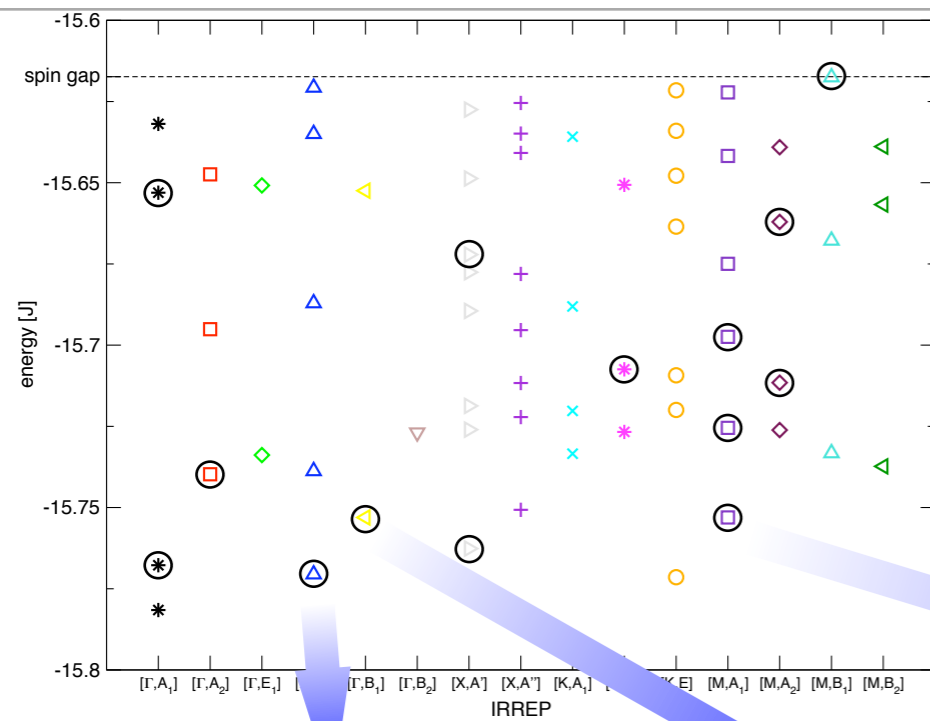


$[\Gamma, B_1], \text{level1}$

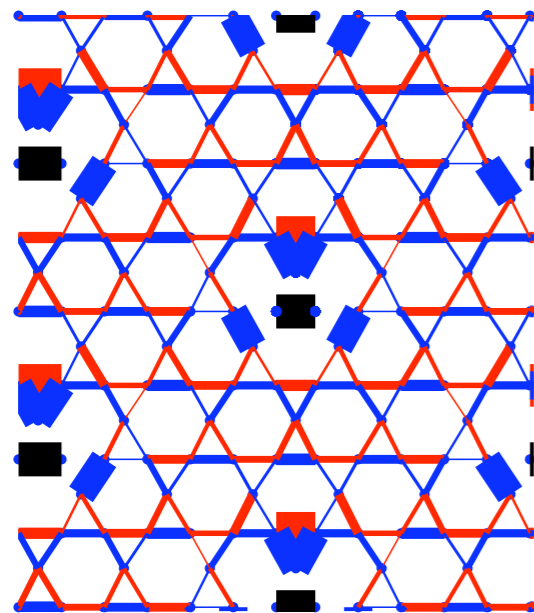




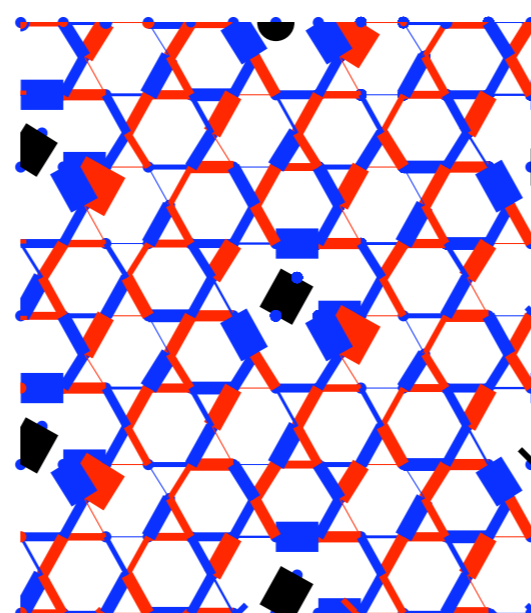
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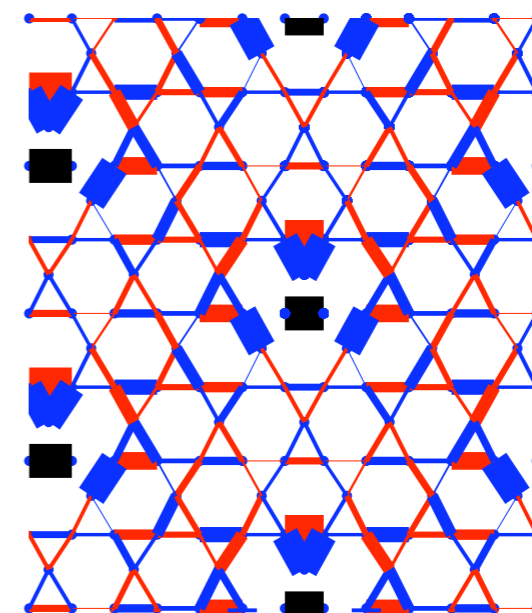
$[\Gamma, E_2]$, level1



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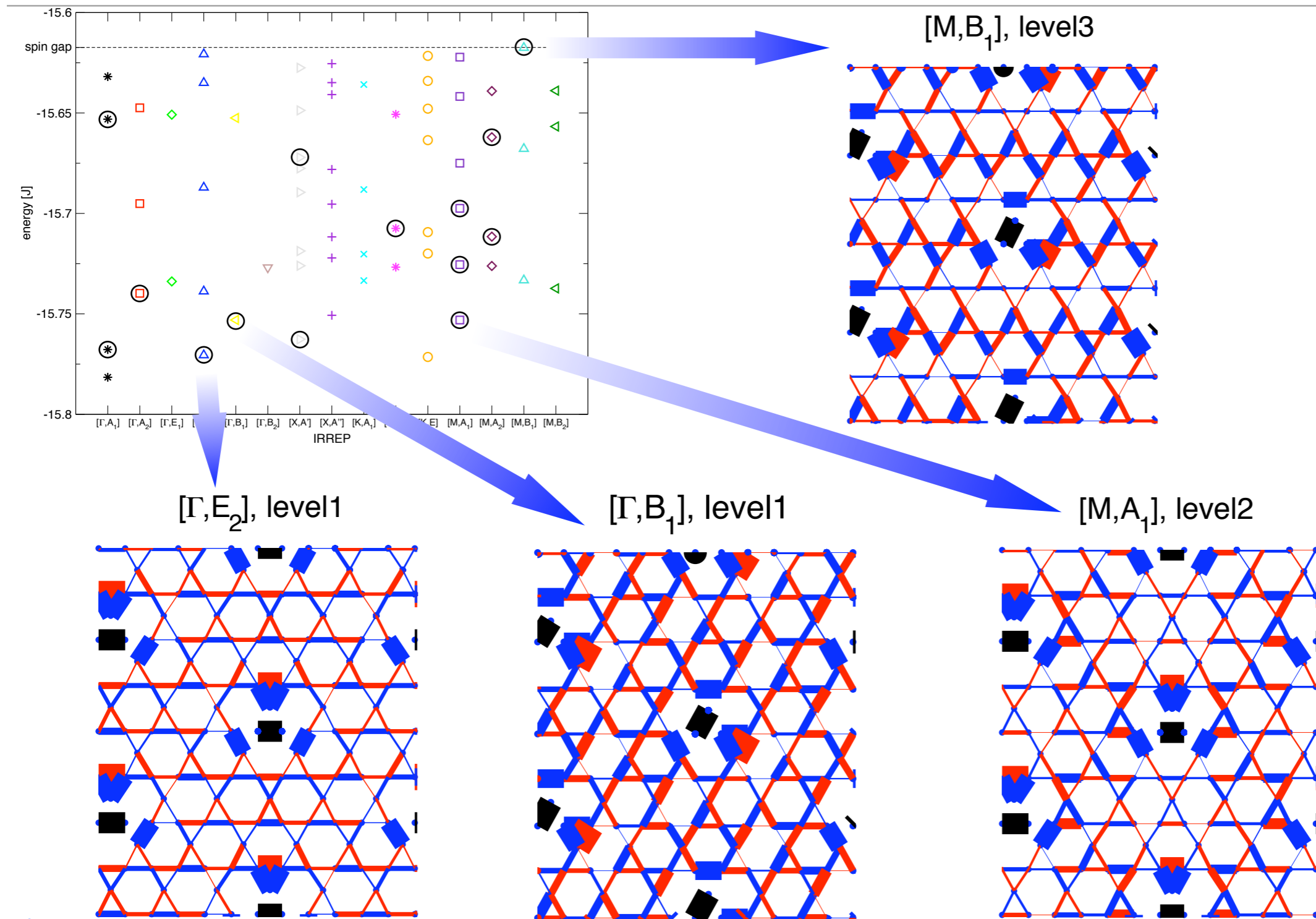


$[M, A_1]$, level2



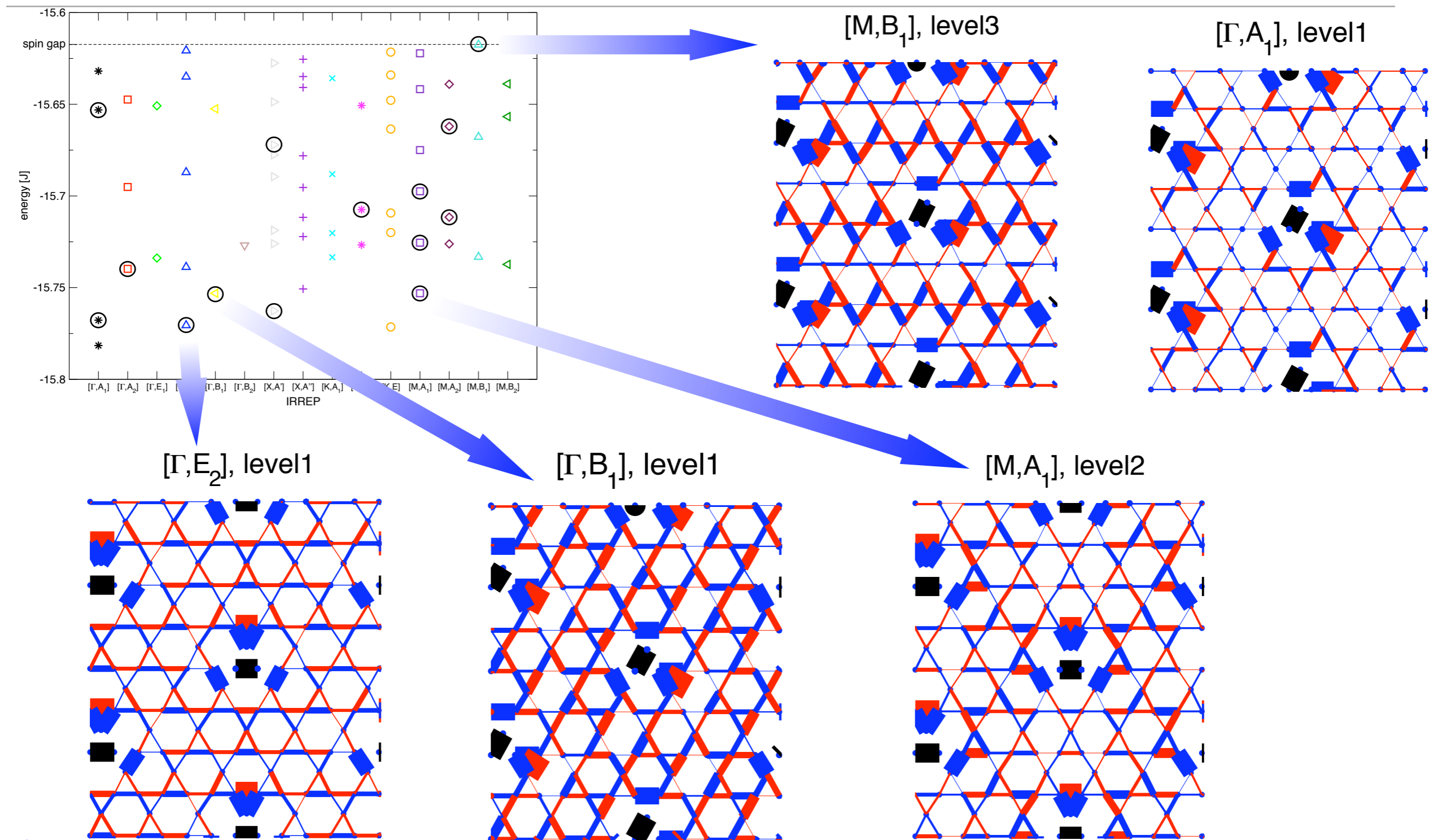


Dimer correlations of low lying singlets (N=36)





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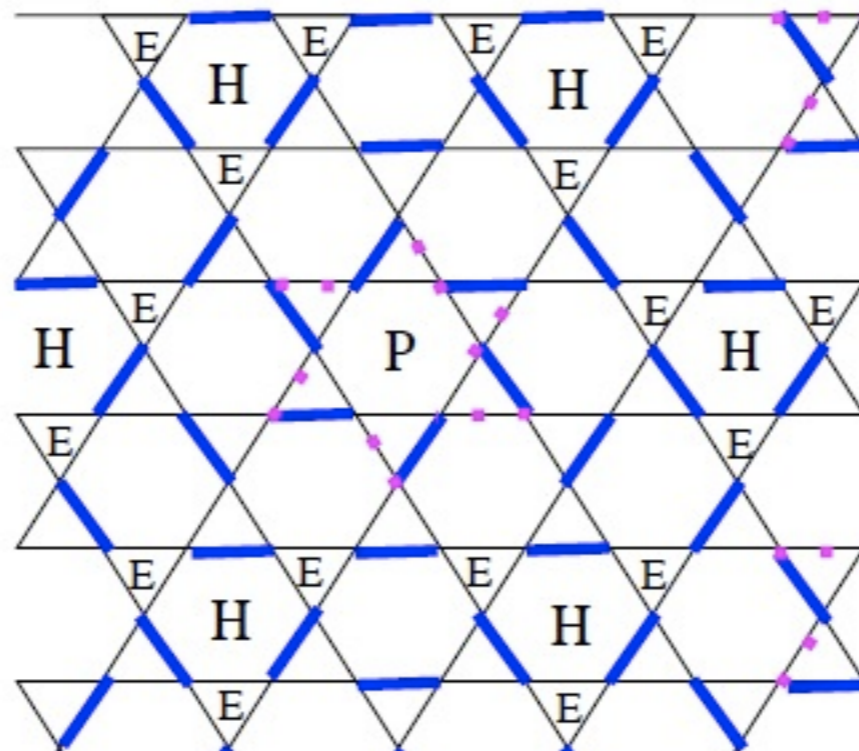
Thermal transitions ?

- Complex VBC order parameter \rightarrow Multi stage phase transitions
- Two-sublattice ordering of empty triangles has highest T_c in classical dimer model both for Kagome and Hyperkagome.



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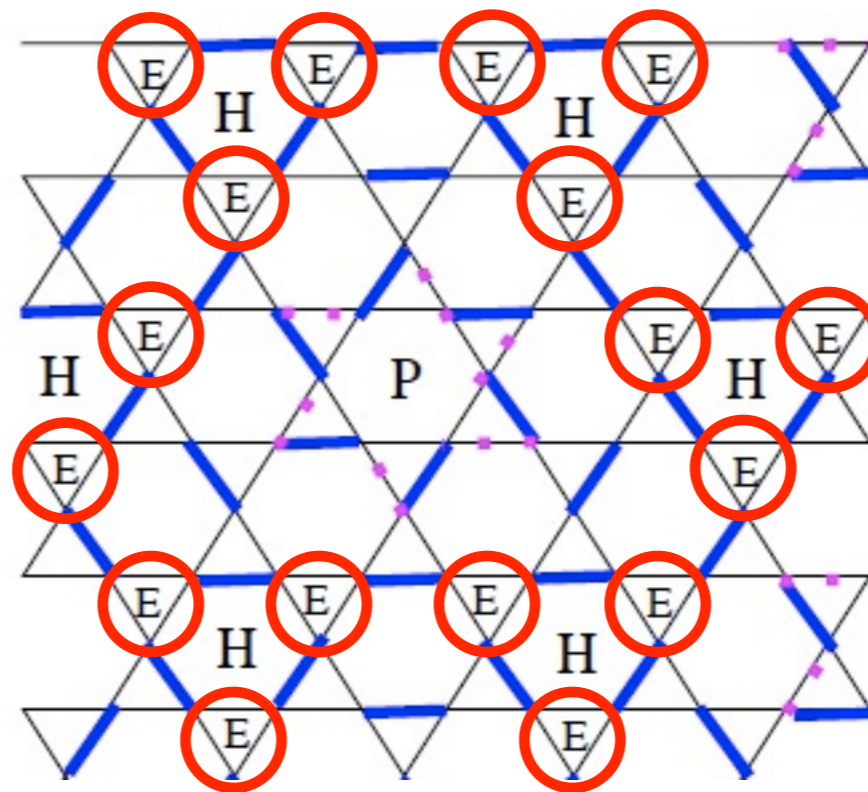


E. Bergholtz, AML, R. Moessner, arXiv:1010:1345
PRL in press



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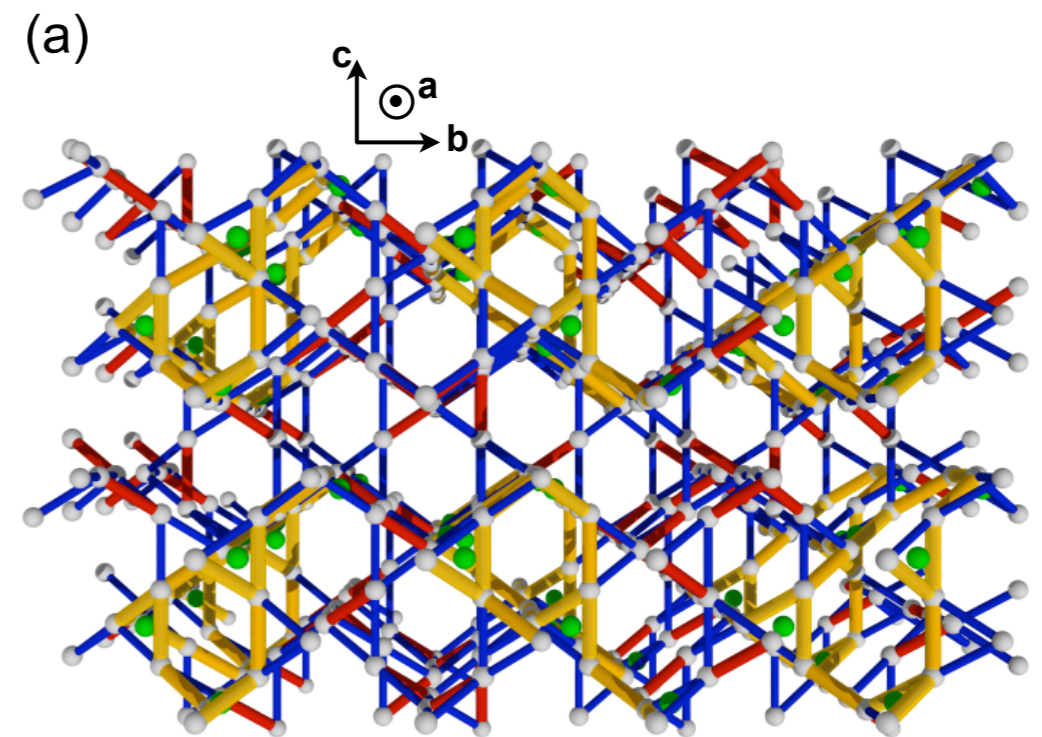
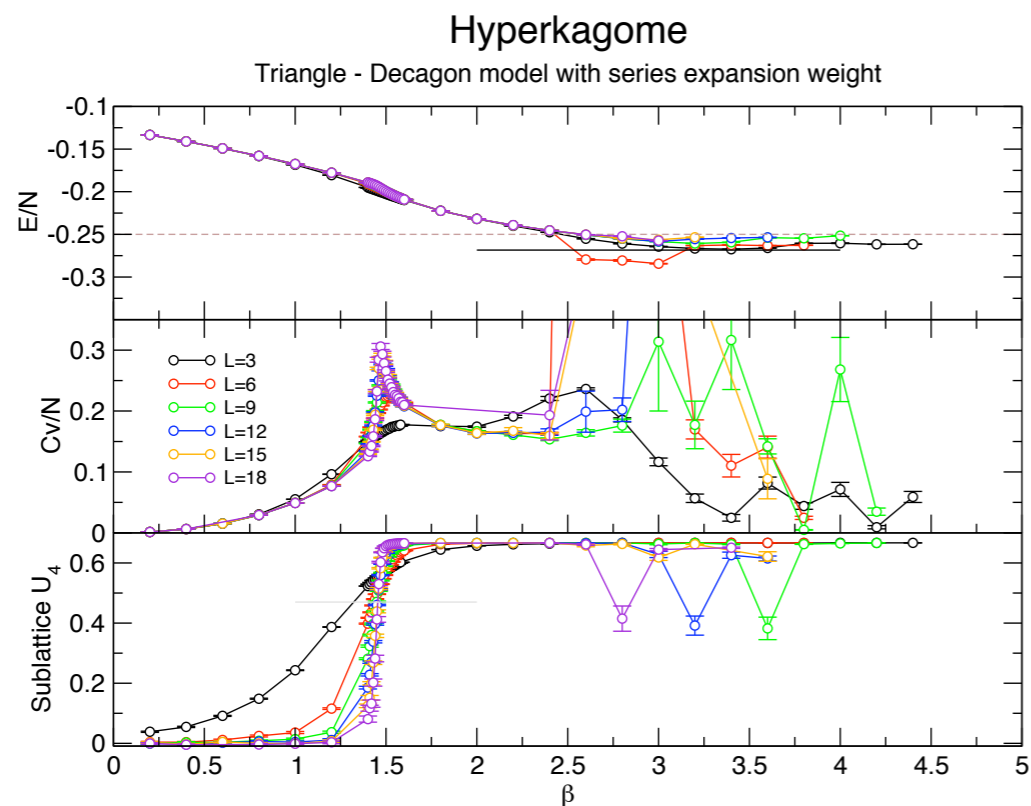


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Thank you !