

# Enhanced Sensing via Anti-PT Symmetry

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In recent times a large body of literature has been devoted to the study of non-Hermitian systems. The central idea behind such studies has been the Parity-Time [PT] symmetry and its basic consequences and applications to sensing. Such systems typically make use of the balanced gain and loss and exhibit topological features. In contrast, we initiated a study of the anti-PT symmetric systems and showed its great use in sensing both linear and nonlinear perturbations [1]. I would describe general features of such systems such as nonreciprocity, exceptional points, level attraction [2]. I would discuss several realizations of such systems and bring out the possibilities of ultrathreshold bistability [3]; enhanced - optical microwave transduction [4]. I would demonstrate latter applications in the context of the anti-PT symmetric magnonics. I would also describe a full quantum theory of the anti-PT symmetric systems and the quantum Fisher information framework [5].

## References

- [1] J M P Nair, D Mukhopadhyay and G S Agarwal, Phys. Rev. Lett. **126**, 180401 (2021)
- [2] J M P Nair, D Mukhopadhyay and G S Agarwal, Phys. Rev. B. **105**, 214418 (2022)
- [3] J M P Nair, D Mukhopadhyay and G S Agarwal, Phys. Rev. B. **103**, 224401 (2021)
- [4] D Mukhopadhyay, J M P Nair and G S Agarwal, Phys. Rev. B. **105**, 064405 (2022)
- [5] J Wang, D Mukhopadhyay and G S Agarwal, Phys. Rev. Research **4**, 013131 (2022)