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Observation of quantum correlation near the exceptional points XINGDA LU, WANXIA CAO, XIN MENG, JIAN SUN, Fudan University, HENG SHEN, University of Oxford, YANHONG XIAO, Fudan University — Recent advances on parity-time symmetric and anti-symmetric optical systems have led to numerous novel optical phenomena and applications. However, quantum statistics of light has not been experimentally studied in such systems. For the first time, we observe quantum correlations in an anti-symmetric optical systems made of flying atoms. Two optical channels, which are dissipatedly coupled, display gain, phase sensitivity and even quantum discord, despite the linear atom-light interaction within each channel. It is found that the discord has a relatively sharp change near the exceptional point. This work provides a new approach to perform nonlinear optics with linear systems by using dissipative coupling, and will open up new directions for non-Hermitian optics.

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