Dynamic structure factor of the square-lattice S=1/2 Heisenberg antiferromagnet[1] HUI SHAO, Beijing Computational Science Research Center and Boston University, YANQI QIN, ZIYANG MENG, Institute of Physics, Chinese Academy of Sciences, ANDERS SANDVIK, Boston University — We use a newly improved stochastic analytic continuation (SAC) method for QMC data to study the dynamic spin structure factor of the square-lattice S =1/2 Heisenberg antiferromagnet at low temperature. We present results for the dispersion curve and the spectral weight of the single-magnon excitation, as well as the full multi-magnon continua along high-symmetry cuts through the Brillouin zone. Our study provides a benchmark for neutron scattering experiments. We focus on the high-energy part of the spectrum (close to the magnetic zone boundary) where the continuum is large and there is a dispersion anomaly not captured by spin-wave theory.

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