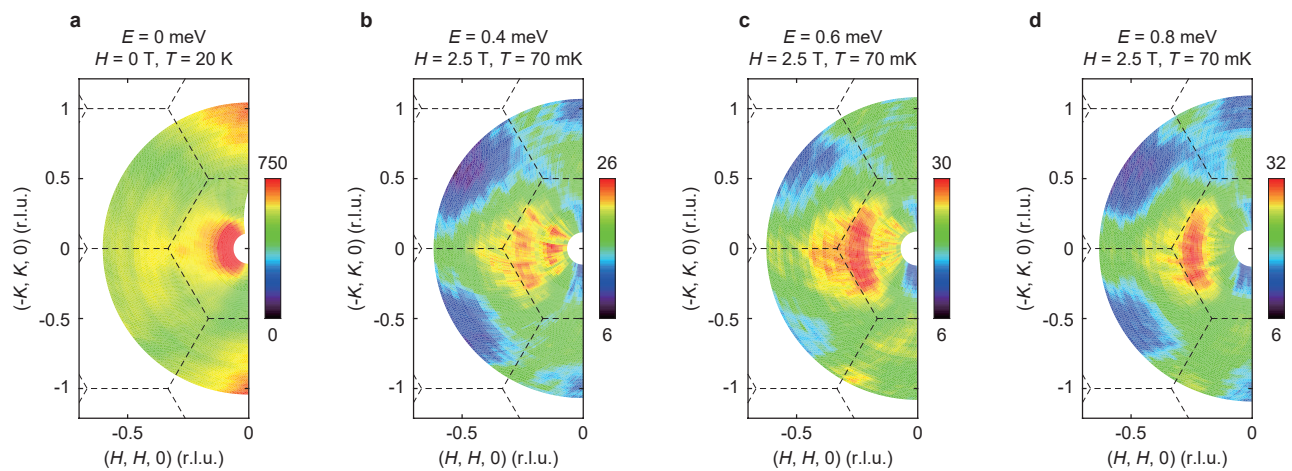


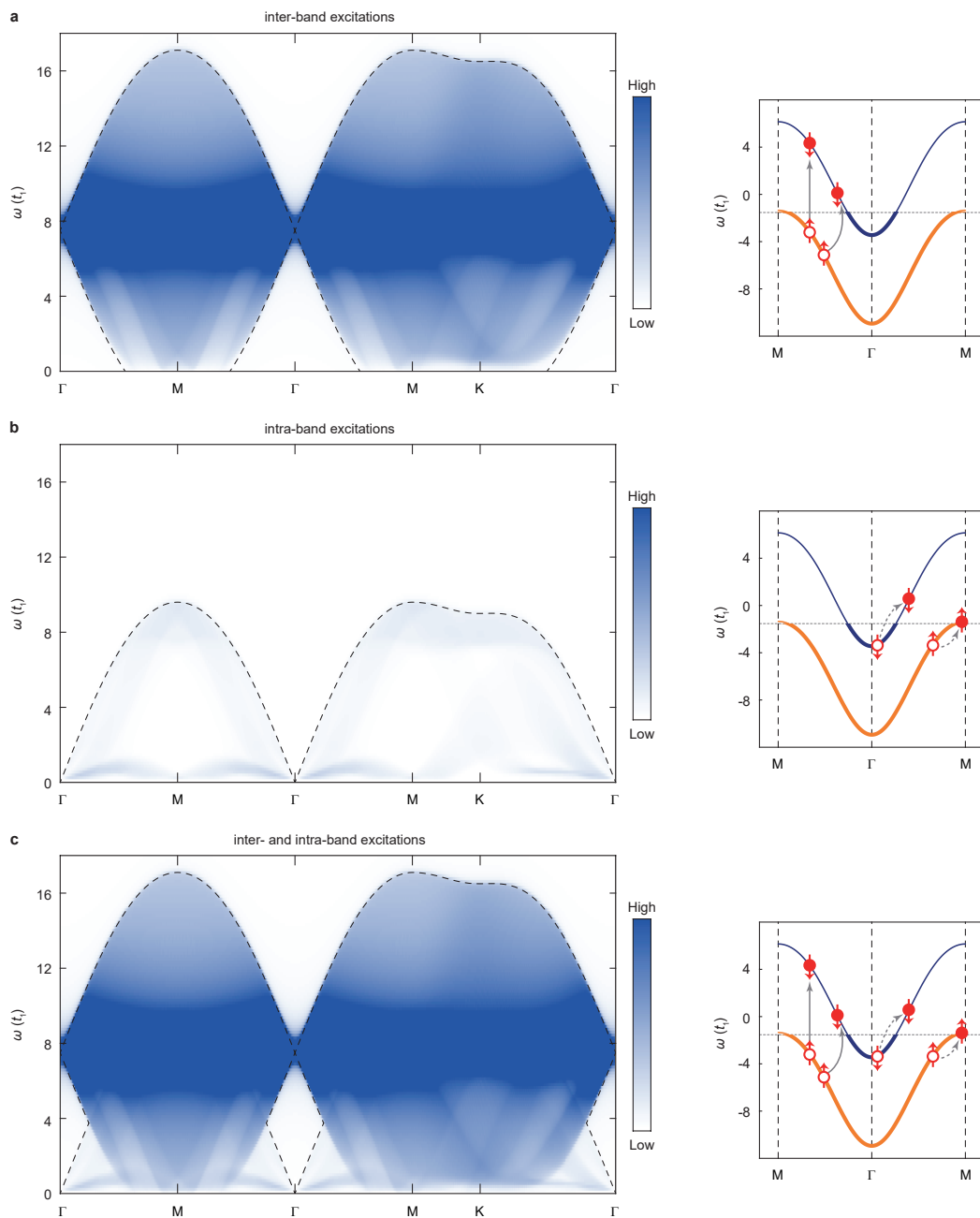
Supplementary Information for

**Fractionalized excitations in the partially magnetized spin liquid candidate  $\text{YbMgGaO}_4$**

Shen *et al.*



**Supplementary Figure 1: Correction of neutron beam self-attenuation.** **a**, Elastic incoherent scattering image at 20 K and 0 T. **b-d**, Raw constant-energy images at the indicated energies. Dashed lines indicate the Brillouin zone boundaries. The colour bar indicates scattering intensity in arbitrary unit in linear scale.



**Supplementary Figure 2: Calculation of the spinon band structure and its excitations in a weak magnetic field.** **a**, The dynamic spin structure factor  $\mathcal{S}_{+-}(\mathbf{p}, E)$  defined in Eq. 3 (left) in the main text and illustration of the vertical and tilted inter-band particle-hole excitations (right). These are the dominant events that are responsible for the spectral peak at  $(\Gamma, \Delta)$  and the upper and lower excitation edges that cross at the peak. **b**, The dynamic spin structure factor  $\mathcal{S}_{zz}(\mathbf{p}, E)$  defined in Eq. 4 (left) in the main text and illustration of the intra-band particle-hole excitations (right). These are analogous to the particle-hole excitations in the zero-field case, and also gives rise to an upper excitation edge at  $\Gamma$ . **c**, The combined dynamic spin structure factor defined in Eq. 2 in the main that is proportional to the observed neutron scattering density. In all the figures we chose  $t_2/t_1$  to be 0.2 and Zeeman splitting gap  $\Delta = 7.5t_1$  where  $t_1$  and  $t_2$  indicate the nearest and next-nearest neighbour spinon hoppings. The colour bar indicates scattering intensity in arbitrary unit in linear scale.