Dynamic Scaling in the susceptibility of the Spin-1/2 Kagomé Lattice Antiferromagnet Herbertsmithite

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— The spin-$\frac{1}{2}$ kagomé lattice antiferromagnet herbertsmithite, ZnCu$_3$(OH)$_6$Cl$_2$, appears to display a quantum disordered ground state with effectively gapless excitations. We show that the dynamic susceptibility of this material displays an unusual scaling relation in both the bulk ac susceptibility and the imaginary part of the dynamic susceptibility as measured by inelastic neutron scattering. This behavior is remarkably similar to that seen in certain heavy-fermion metals which are doped to be near a quantum critical point.

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