

# EXCITATION SPECTRUM AND SUPEREXCHANGE PATHWAYS IN THE SPIN DIMER $\text{VODPO}_4 \cdot \frac{1}{2}\text{D}_2\text{O}$ Ref. (1)

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Magnetic excitations have been investigated in the spin dimer material “VODPO” using inelastic neutron scattering. A dispersionless magnetic mode was observed at an energy of 7.81(4) meV. The wave vector dependence of the scattering intensity from this mode is consistent with the excitation of isolated  $\text{V}^{4+}$  spin dimers with a V-V separation of 4.43(7) Å. This result is unexpected since the V-V pair previously thought to constitute the magnetic dimer has a separation of 3.09 Å. We identify an alternative V-V pair as the likely magnetic dimer, which involves superexchange pathways through a covalently bonded  $\text{PO}_4$  group. This surprising result casts doubt on the interpretation of  $(\text{VO})_2\text{P}_2\text{O}_7$  as a spin ladder.

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