# Supplemental material

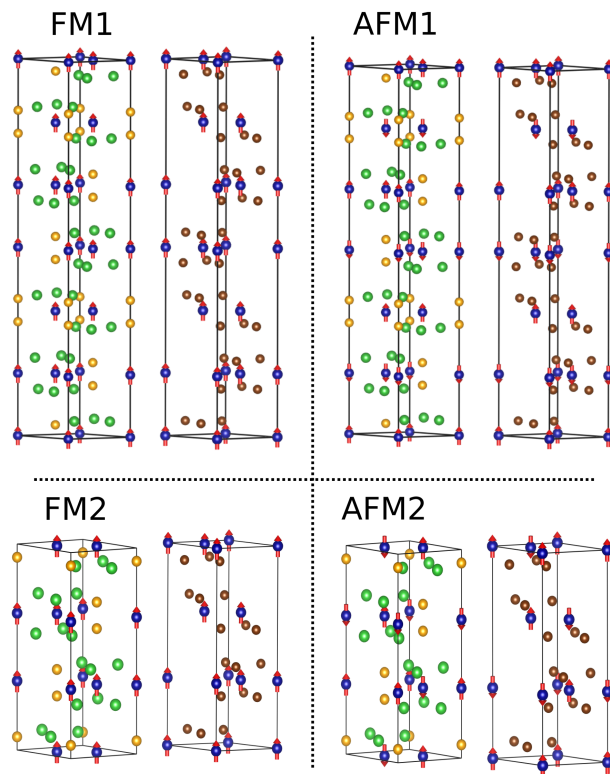## MAGNETIC CONFIGURATIONS TO EXTRACT $J_{in}$ AND $J_{out}$



FIG. 1. Magnetic configurations used to compute the magnetic exchange constants. Cr atom in blue, Br atom in brown, Ge atom in yellow and Te atom in green.

Magnetic exchange constants ($J_{out}$ and $J_{in}$) were computed using the configurations shown in Fig. 1. The following equations were obtained considering a Heisenberg-type Hamiltonian

$$J_{out} = \frac{E_{AFM1} - E_{FM1}}{27}$$
$$J_{in} = \frac{1}{3}\left(\frac{2(E_{AFM2} - E_{FM1})}{27} - J_{out}\right), \quad (1)$$

where $E_{FM1}$, $E_{AFM1}$, $E_{FM2}$ and $E_{AFM2}$ are the energies of the magnetic configurations (Fig. 1).