Supporting Information for "Electronic Correlation Effects on Stabilizing a Perfect Kagome Lattice and Ferromagnetic Fluctuation in $LaRu_3Si_2$"

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TABLE S1. Values of Hubbard U and Hund's coupling J_H calculated by the code *R_Coulomb.py* in DFT+EDMFTF package. These values are used for both DFT+U and LDA+DMFT calculations.

U (eV)	1.1	1.5	2.0	3.0	4.0	4.5	5.0	5.5	6.0
J_H (eV)	0.389	0.476	0.563	0.692	0.782	0.817	0.848	0.874	0.897

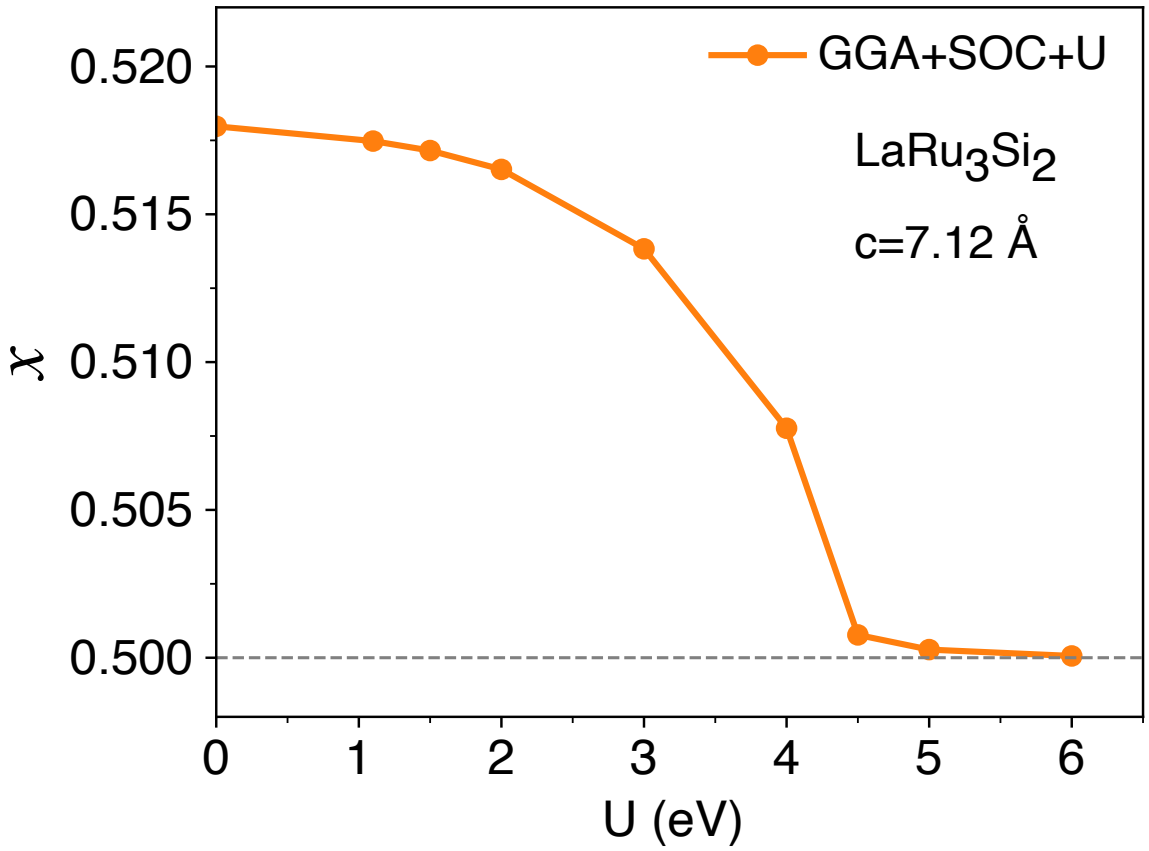

FIG. S1. Fractional coordinates x of Ru sites as function of Hubbard U, relaxed by GGA+U with spin-orbital coupling.

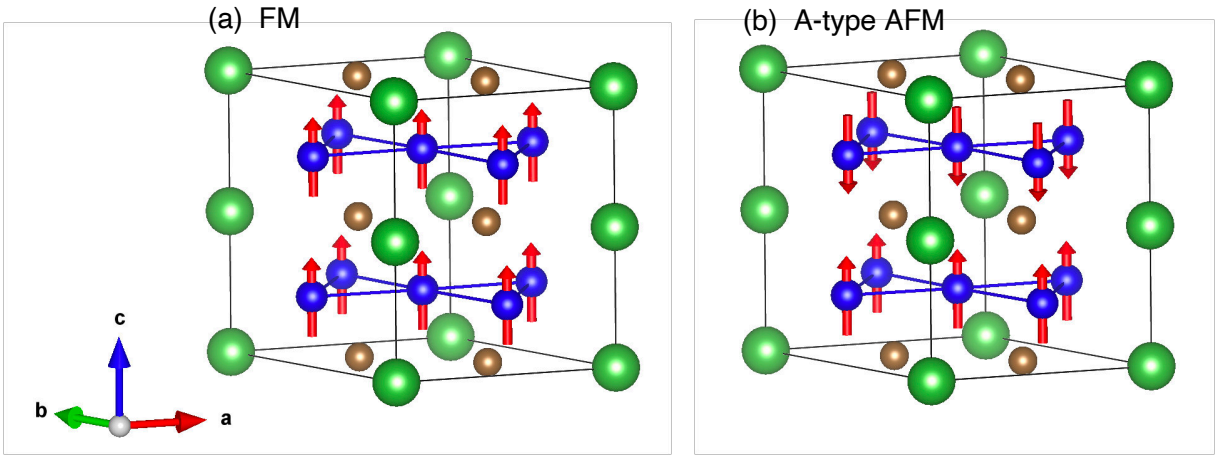

FIG. S2. Magnetic configurations considered in the GGA+U calculations.

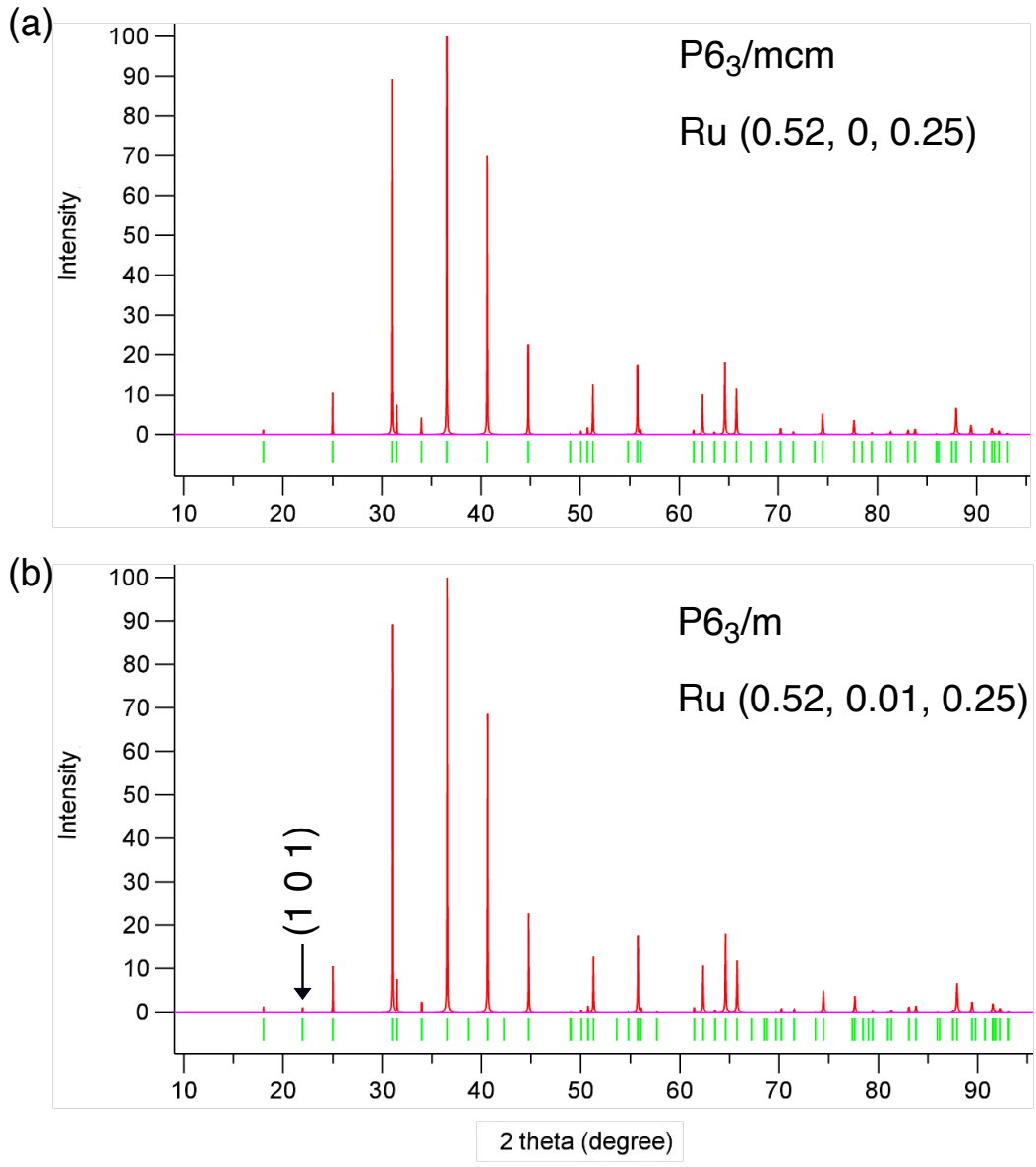

FIG. S3. Simulated XRD pattern of the possible distorted Kagome structure of $LaRu_3Si_2$. (a) For space group $P6_3/mcm$ with Ru at (0.52, 0, 0.25). (b) For space group $P6_3/m$ with Ru at (0.52, 0.01, 0.25). Lattice parameters are $a = 5.676$Å and $c = 7.12$Å. Their only difference is that there is an additional weak peak at (1 0 1) for $P6_3/m$.