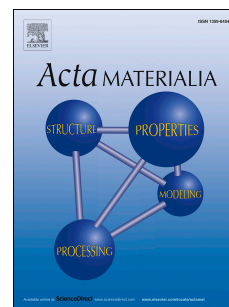


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An atomic displacive model for $\{10\bar{1}2\}$ $\langle\bar{1}011\rangle$ twinning in hexagonal close packed metals with the emphasis on the role of partial stacking faults in formation of $\{10\bar{1}2\}$ twins

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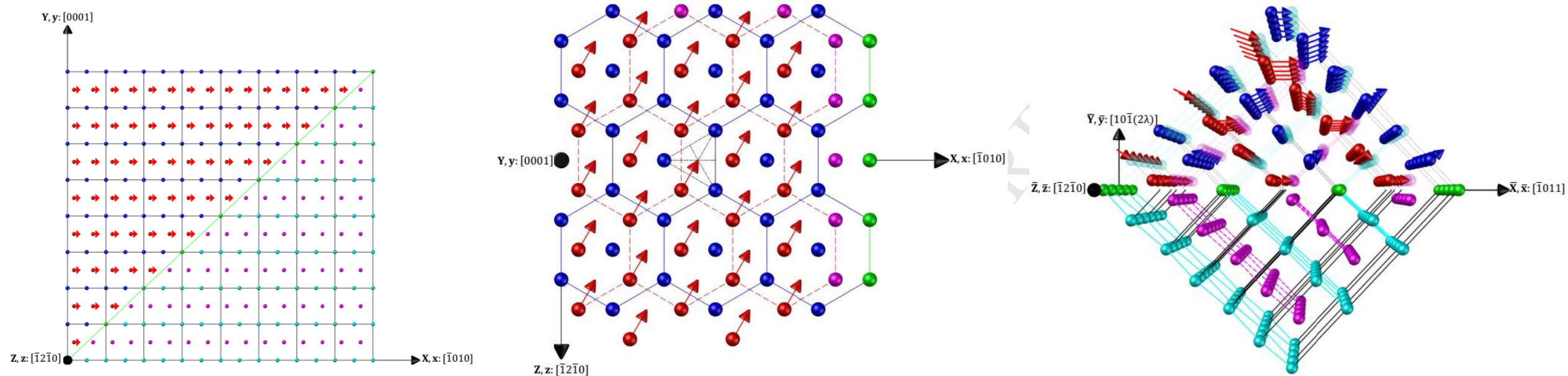
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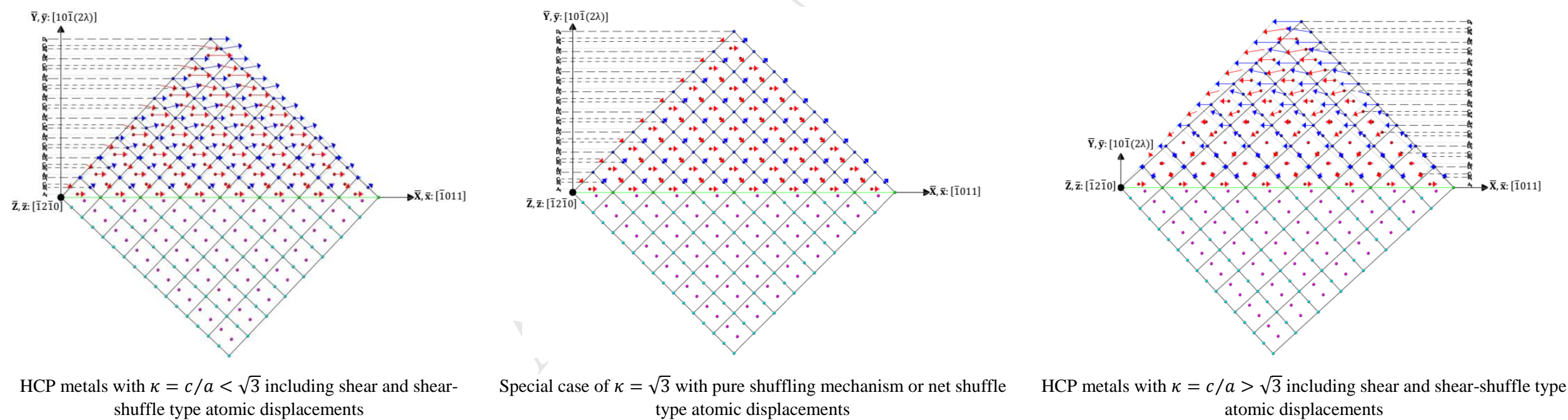
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Graphical Abstract



(1) Formation of Partial Stacking Faults on B-type basal planes by $1/3 [0\bar{1}10]$ vectors

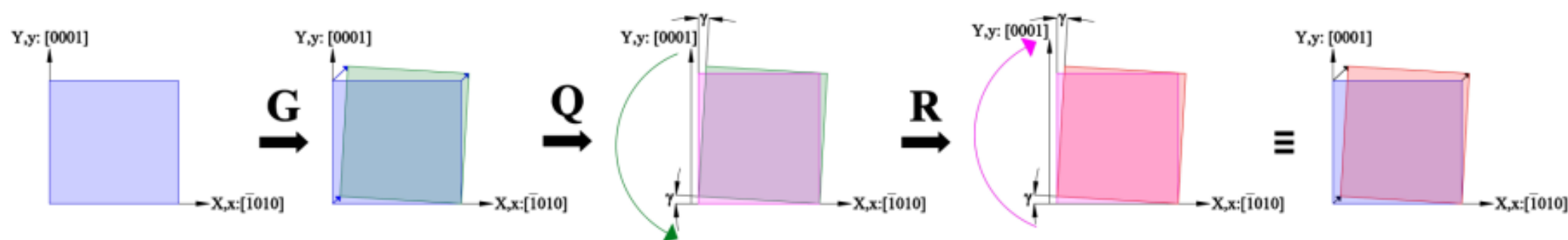
(2) Zonal-twinning mechanism in the new model to accomplish $(10\bar{1}2)[\bar{1}011]$ twinning mode for HCP metals



HCP metals with $\kappa = c/a < \sqrt{3}$ including shear and shear-shuffle type atomic displacements

Special case of $\kappa = \sqrt{3}$ with pure shuffling mechanism or net shuffle type atomic displacements

HCP metals with $\kappa = c/a > \sqrt{3}$ including shear and shear-shuffle type atomic displacements



Macroscopic effect of the new twinning mechanism

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