Sorting Criterion for Slip and Twin system in HCP

YunJo Ro

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This document attempts to show how we sort the order of the slip and twin system for Hex (or hcp) structure in lattice.f90.

1 Slip system

An intersection between slip and basal plane is used in order to sort the slip system as illustrated in Figures 1 and 2. Numbers in Figures 1 and 2 indicate the sequence of each slip system in "lattice.f90". In "lattice.f90", No. 4 - 6 for basal and prism <a> slip do not include (Figure 1). In Figure 2, pyramidal slip <c+a> was used two criterions to sort the 12 slip systems; i) intersection between pyramidal slip plane and basal plnae, and ii) <a> direction.

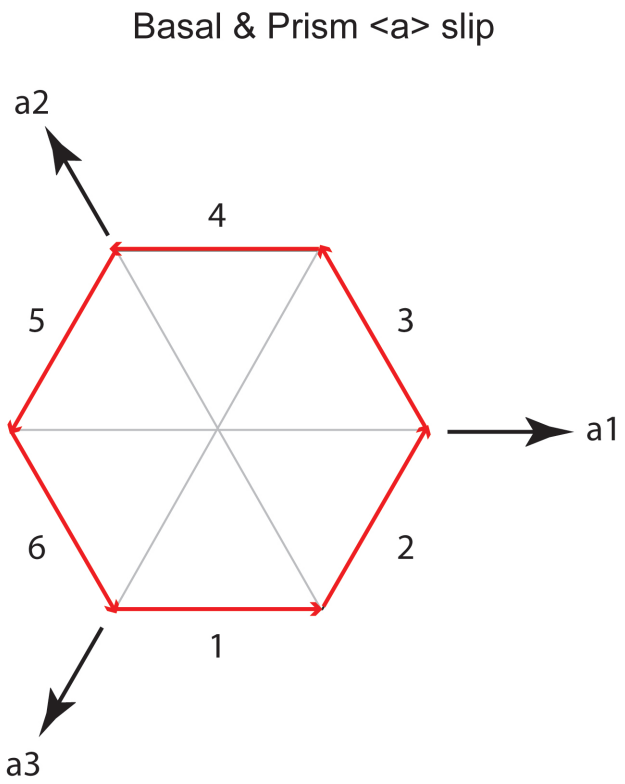

Figure 1: Basal and prism <a> slip.

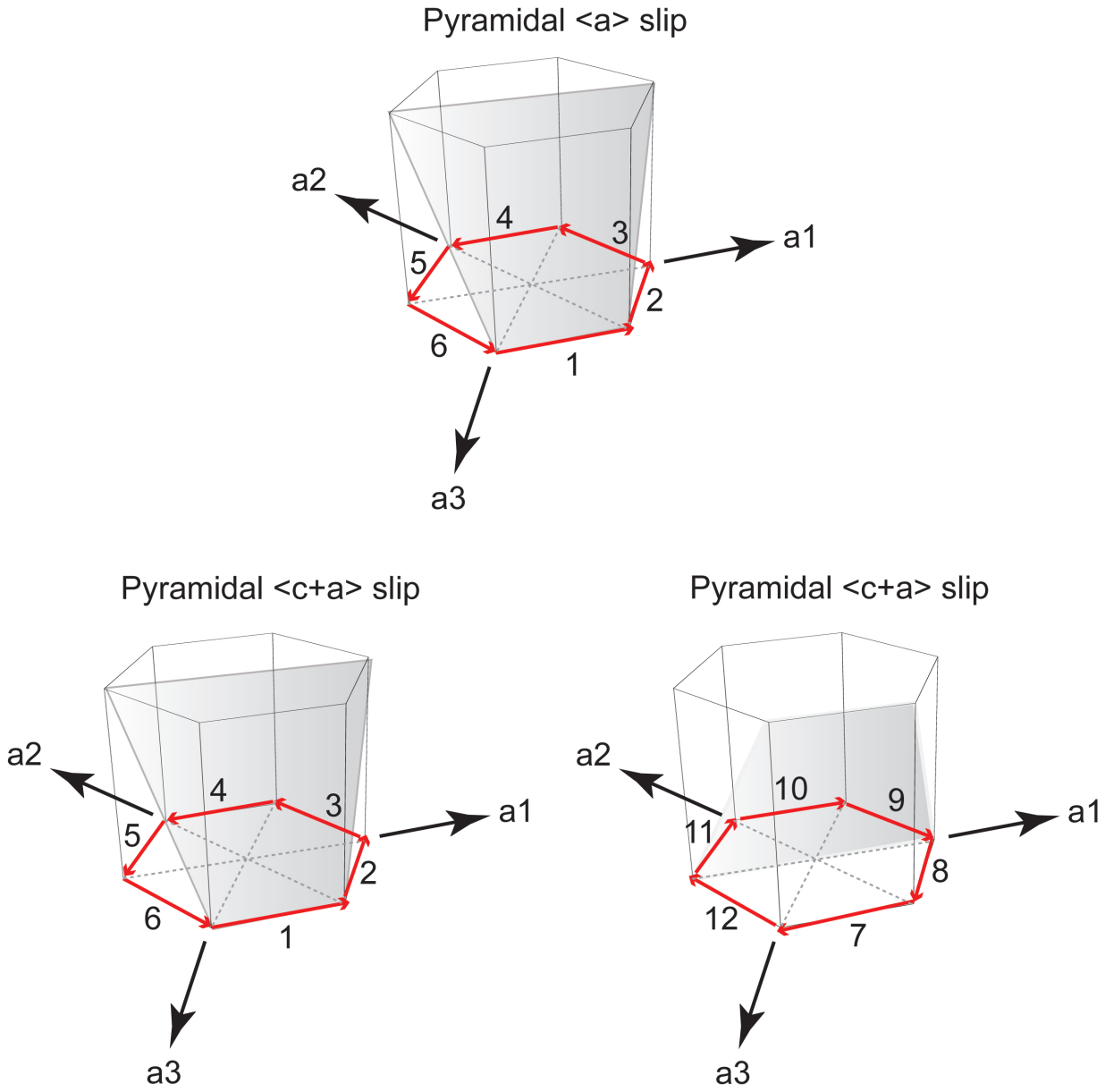

Figure 2: Pyramical <a> and <c+a> slip.

2 Twin system

An intersection between twin and basal plane is used in order to sort the twin system as illustrated in Figures 3 and 4. Numbers in Figures 3 and 4 indicate the sequence of each twin system in "lattice.f90".

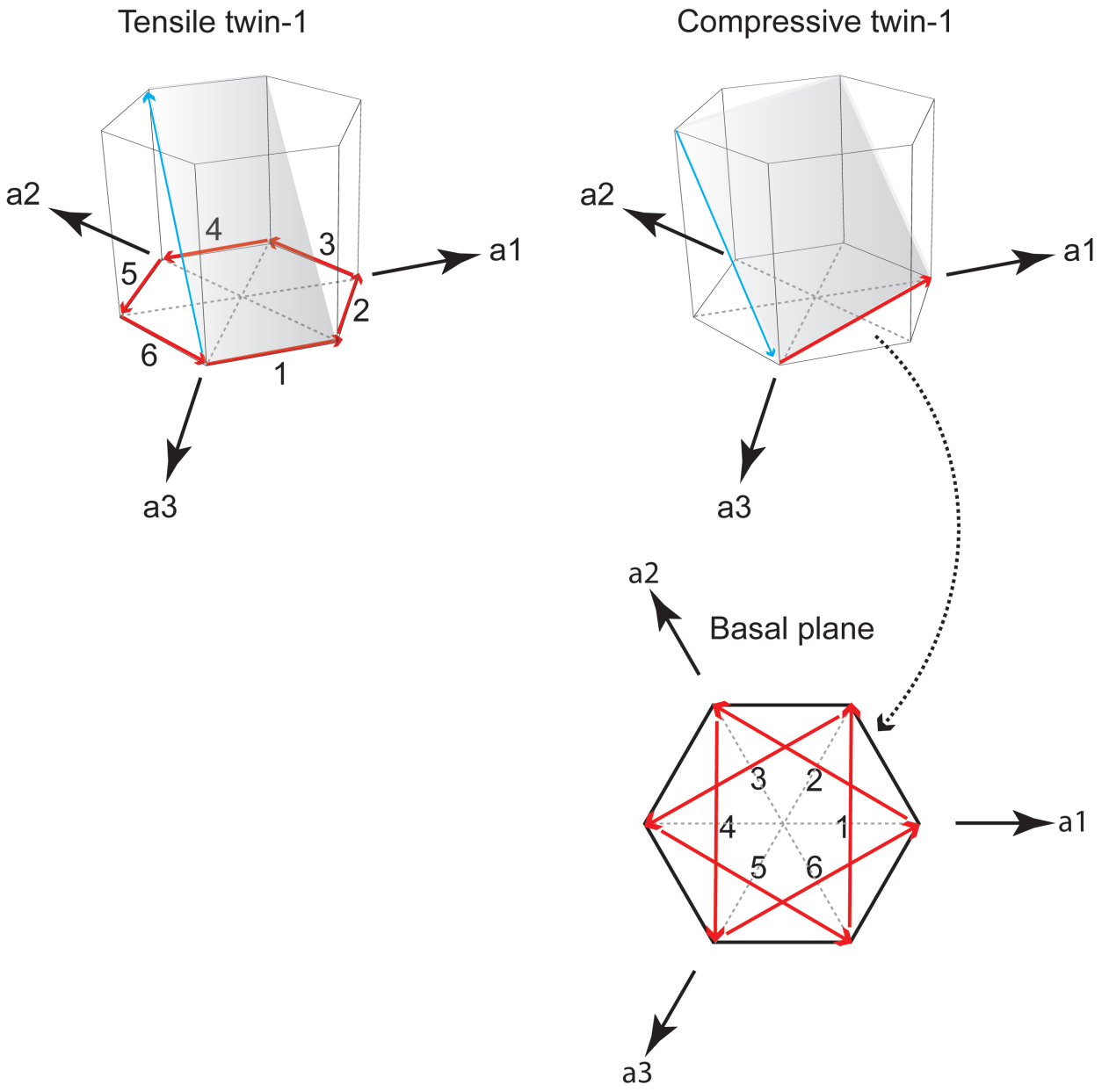

Figure 3: Tensile and compressive twin type 1

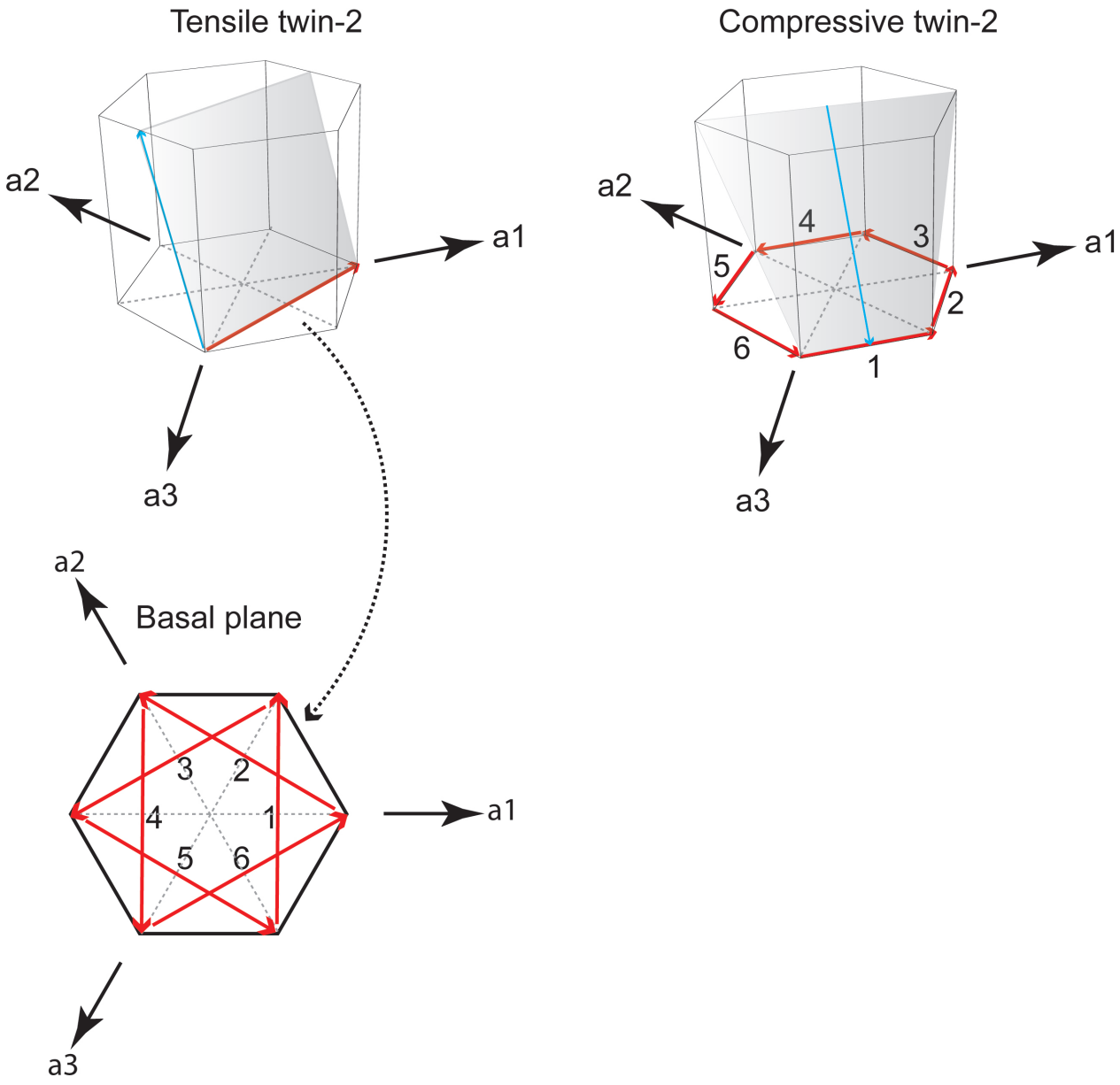

Figure 4: Tensile and compressive twin type 2