Engineering Fine Scale $\alpha$ Precipitation for High Strength $\beta$-Ti alloys

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Program Goal

• Improve the strength and creep resistance of $\beta$-Ti alloys via a modification of heat treatment schedules to highly refine the distribution of $\alpha$-precipitates

Approach

• Combine experimental methods (SEM, TEM & 3D atom probe tomography) and thermodynamic modeling to document precipitation behavior
• Characterize the deformation mechanisms in creep or tensile tested $\beta$-Ti alloys

Benefits

• Develop novel heat treatment strategies for increasing the strength and creep resistance of $\beta$ or near-$\beta$ high strength Ti-alloys
• Understand the role of $\alpha/\beta$ interfaces on deformation mechanisms associated with creep and tensile behavior in these alloys

Orientation of precipitates in $\beta$21S alloy

Project Duration
August 2012 to June 2015