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Characterizing the effects of volcanic ash infiltration into 7 wt% yttria stabilized zirconia thermal barrier coatings CHANCE BARRETT, LAURENE TETARD, SEETHA RAGHAVAN, University of Central Florida, RAVISANKAR NARAPARAJU, German Aerospace Center — Volcanic ash (VA) causes thermochemical and thermomechanical degradation on thermal barrier coatings (TBC). The thermomechanical degradation begins after the infiltrated molten VA cools, producing a gradient in stress across the TBC. The thermochemical degradation arises from the phase destabilization caused by VA in the TBC leading to a detrimental volume expansion within the TBC. In this study, our primary interest is to study stress distributions caused by VA infiltration with Raman confocal spectroscopy and Lorentz contact resonance (LCR). All measurements will be carried out on 7wt.% yttria stabilized zirconia (7YSZ) samples with Icelandic VA ingression annealed at a temperature of 1200 for annealing times 10 minutes, 20 minutes, 30 minutes and 60 minutes will be compared.

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