1125-J1-3024 **Bhagya Athukorallage*** (bhagya.athukorala@ttu.edu), Whitacre College of Engineering, Department of Mechanical Engineering, Lubbock, TX 79409, and **Darryl James**, Whitacre College of Engineering, Department of Mechanical Engineering, Lubbock, TX 79409. *Heat transfer analysis of road pavement system with phase change materials.*

Thermally-induced permanent deformation (rutting) is one main drawback faced by asphalt pavements over their life period which negatively affects the performance of roads. Phase change materials (PCMs) possess the ability to absorb a large amount of energy (latent heat) at a constant or narrow temperature range, and therefore the incorporation of phase change materials in asphalt pavement mixtures may help to regulate extreme temperature regions in pavement structures.

In this study, we consider a PCM- embedded pavement structure and assess its thermal performance through numerical simulations. The volume-averaged energy equation with phase change is used to analyze the transient temperature behavior in the integrated PCM pavement system. It is assumed that pavement surface is subjected to time dependent solar irradiation and convective heat fluxes. We explore the performance of the new PCM-embedded pavement system with varying PCM volume fractions. Our results show that a higher temperature drop through the pavement surface with PCM can be realized compared to a conventional pavement without PCM and the effective thermal conductivity of the PCM-embedded layer plays a key role in the heat transfer through the new pavement system. (Received September 20, 2016)