

# The “roof” as a passive cooling system, towards optimizing the thermal comfort of Saharan constructions. Case of building’s Roofs in the M’Zab valley

Meryem Kadri<sup>(1)</sup> and Ammar Bouchair <sup>(2)</sup>

University of Guelma, Algeria, Email: [kadrimeriem33@yahoo.com](mailto:kadrimeriem33@yahoo.com)

University of Guelma, Algeria

## Abstract

In hot regions, excessive heat and high temperature are the major problems of thermal discomfort, especially in summer. Several traditional practices and passive cooling methods have been made to improve thermal comfort inside dwellings. Including; compactness, local materials, passive cooling systems: Wind towers, patios, Chebek, vegetation ... etc. The M’Zab valley in southern Algeria is one of the traditional cities that have applied these practices par excellence. Among these practices, the use of the roof terrace. During the day, the thick roof terrace acts as an insulator to reduce the transfer of heat to the interior. During the night, the residents open the Chebek to refresh the interior spaces through the air circuit through the patio. In addition, the roof terrace can be used so that the inhabitants can sleep there. So, this work is interested in the study of roofs built in the ksour of the M’Zab valley, its forms, materials, etc. Then, we will do an in situ measurement work using the measuring instruments to qualify the indoor thermal environments through the measurements of ambient air temperatures and temperatures of roof surfaces in summer. The object of work is to lift the veil on the role of roofs in Mozabite constructions to control temperature variations to achieve pleasant thermal comfort.

**Keywords:** Roofs, Thermal comfort, passive cooling, In situ measurement, M’Zab valley.

## Biography

I’m phd student in architecture from Algeria.