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Simplified architectural method for the solar control optimization of awning and external wall in houses in hot and dry climates

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In extremely hot and dry climates, like northwestern Mexico, solar gain reduction in houses using solar passive techniques is important for improving comfort inside the construction and to save costs in electrical cooling during the whole year, because the winter season is also hot in those regions. A new one-dimension method is proposed to analyze the interaction between two common shading devices: awnings and external walls to reduce insulation on the facade and inside the house due to fenestration. The method is demonstrated by optimizing a typical dwelling with an azimuth of 90° (east), which, achieves 45% reduction in direct solar insulation during the summer solstice on the profile of the facade. Results showed that this method is simple and reliable in increasing the shadow on the facade and to block completely the solar beam radiation on the windowpane with optimal relations between these shading devices.

Palabras clave: Shading, Solar construction optimization, Solar control