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Sustainable Indoor Thermal Comfort Optimization in Public Buildings and its Impact on Occupants' Wellbeing

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Abstract. Urbanization, technological advancements and climate change have been the main driving factors for people to be more inclined to spend almost 90% of their time indoors. As a result, the effect of indoor environmental conditions on building occupants has increased significantly, more notably on older people. This demographic is considered among the vulnerable communities as they become more susceptible to change in their surrounding environment, especially temperature as their activity levels and metabolic rate varies with time. Thermal comfort is a parameter of indoor environmental quality that is influenced by a range of factors including environmental conditions, individual differences, and lifestyles and in its absence, people may experience severe discomfort and sick building syndrome (SBS). As a result, this paper aims to develop design guidelines for the optimization of indoor thermal comfort in public buildings, homes for older people specifically, using passive techniques that are adaptable in hot climate and are applied along different building life cycle stages. This will be achieved through the conduction of a thorough literature review to develop a comprehensive background about the topic and its key pillars. Secondly, a case study in hot climate will be analyzed and used as a reference to study the applicability of the proposed passive design guidelines in indoor thermal comfort optimization without compromising other indoor environmental quality factors. This study will conclude with a set of design recommendations for future projects.