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Presentation title:	**Analysis of Wind Catcher, Decorative Pool and Outlet Opening Combinations on Evaporative Cooling of Residential Interiors**

In residential applications, energy saving is possible with alternative cooling methods. Evaporative cooling, which is one of them, is based on the principle of taking heat from the air by evaporation of water. As the water evaporates, it draws heat from the air and causes the air to cool; in this way, it also causes changes in relative humidity of the room. In this study, cooling effect of decorative pool with windcatcher; an important vernacular architectural detail especially found in the city of Yazd, Iran was investigated for energy efficiency.

CFD solutions of previous swimming pool studies in literature have been verified and the methods used in these studies has been integrated into this present 3D model with windcatcher. However, in previous studies, simulations were carried out with a uniform velocity distribution for the windcatcher's inlet. In this study, the velocity profile at the section of the windcatcher and gauge pressure for outlet, which was located at the rear of the building, were extracted by performing external flow analysis and then subsequent investigations were continued using the results as inputs.

The water vapour was defined as a mass source spreading perpendicularly from the interface of air-water at the pool. The temperature and relative humidity distribution of air interacting with this mass source in the room were analyzed. Evaporation rate was calculated according to ASHRAE Fundamental Book with typical activity factor. Study also includes optimization case for four different outlet positions and two wind velocities. These positions and outdoor air velocities are chosen respectively 0.6, 1.5, 2.4, 3.3 meters above the ground and 4 and 6 m/s. The best air comfort was detected for these parameters. The simulations were carried out in ANSYS Fluent software program and k-epsilon turbulence model was used in all solutions with coupled algorithm.

CV:

Murat Çakan was born in 1967 in Edirne, Turkey. He graduated from Istanbul Tecnical University, Faculty of Mechanical Engineering in 1992 with a degree in Bachelor of Science. In 1994 he finished the Diploma Course of von Karman Institute for Fluid Dynamics after which he started his PhD in Université de Louvain-la-Neuve on “Gas Turbine Cooling”. In 2000 he started working as research assistant at the faculty he graduated from and became assistant professor there in 2003. Since then he has been giving courses on Turbomachinery, Fluid Mechanics, Engineering Ethics, Linear Algebra and Power Plants. Between 2007-2015 he worked as director of ITU Science Center whose aim has been disseminating the joy of science amongst children. Murat Çakan is the author of “Etymological Stories about Technical and Scientific Terms” and translated several children and professional books from English and Greek languages.