The Wind Egg: Wind Tunnel World

Introduction: Calibration Models as Tuning Forks for Universal Space

Wind tunnels first appeared in the early 20th century and can now be found all over the world. Their sole function is to make the wind blow uniformly. These tunnels are thresholds for air bound things—things that move through the air (e.g. aircraft), things around which air moves (e.g. skyscrapers), and all things that move air through them to move things through the air (e.g. jet engines)—to pass before they can enter our industrially produced world. They play a critical role in testing our world, and yet, few of us have actually seen the wind tunnels themselves. The wind tunnel is therefore an "other-space" that is designed to reproduce "any-other-space" yet it achieves this by creating a condition of laminar flow (uniformly moving air) that exists in "no-other-space."

Air is a fluid and we are swimming in it. However, if the density of fluid used in a study is changed to that of, say, water, much higher regimes of velocity can be simulated at reduced velocities of the fluid in the test. Each wind tunnel captures an aspect of the fluid world. Compiled together they consist of the totality of the Wind Tunnel World.

Calibration Is Key

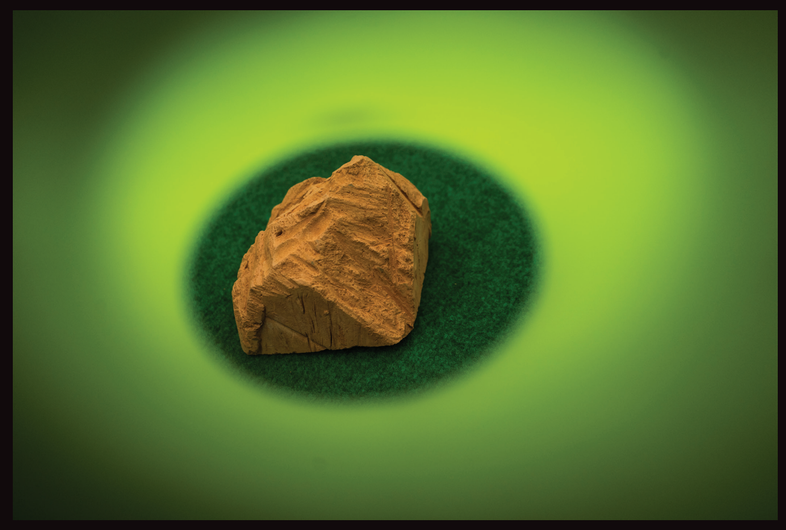
Calibration ensures that an instrument is measuring the phenomena observed and not merely its own body. It ensures that the representation is bound to reality and that this reality is being created in accordance with its representation. Any discrepancy would be distributed throughout the industrially produced world with likely disastrous results. It is for this reason that on average over half the time spent on any wind tunnel experiment consists of calibration tests and procedures to nullify the very devices recording the target phenomenon. The nullification of observation is objective.

Wind tunnels reproduce atmospheric phenomenon at reduced or enlarged scales within their test sections. They are designed to study the interaction of objects with the wind and each one is designed to capture a specific cross-section of this fluid regime. The cross-sections are largely determined by velocity.

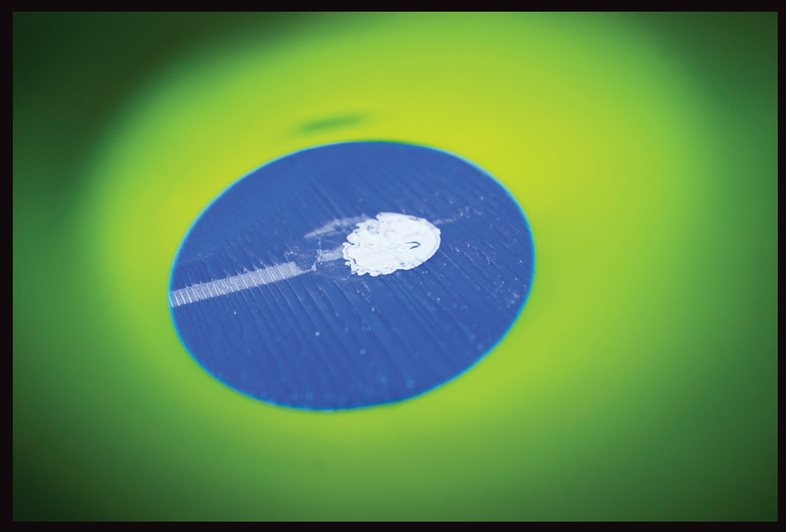
What Is a Calibration Model?

Calibration models are essentially tuning forks for wind tunnels. They are used to ensure that each wind tunnel is in fact the same place. In order to do so, a calibration model must be mapped entirely. This is the process by which a *thing* becomes a *model*. This mapping must be done prior to the model entering a wind tunnel so that the turbulent effects of the form in laminar flow can be measured and profiled. A calibration model allows for the presence of its body to be nullified. This is for the sake of measuring the traces that this body leaves. These turbulent traces ought to be the same in each and every wind tunnel.

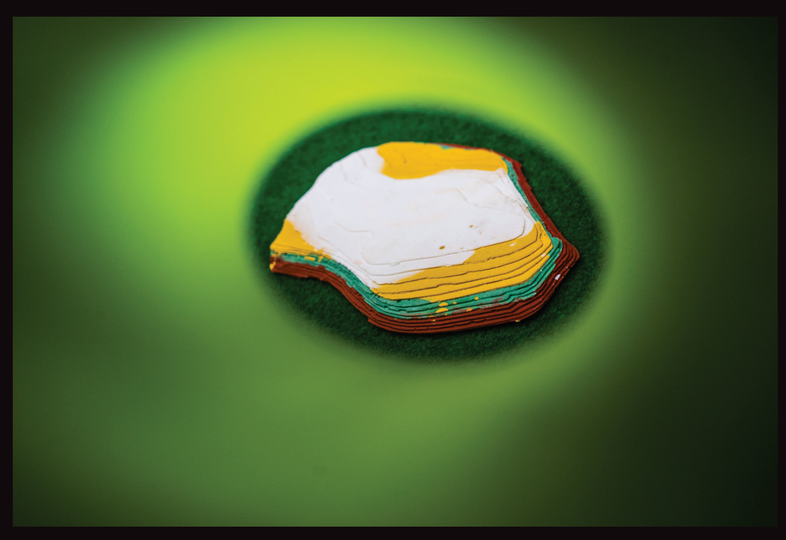
On a more pragmatic note one researcher states that the reason they use calibration models is to "...[establish] Serbian standard wind tunnels competitive with the top wind tunnels in the world. For these purposes, it is very important to certify the overall reliability of the Experimental Aerodynamic Division of Military Technical Institute (VTI)'s wind tunnels by comparing standard wind tunnel test data with data acquired in leading overseas wind tunnels."8 While this researcher is speaking about Serbian facilities, the same is true for any facility. Calibration is a means by which the periphery can become equivalent with the centers of capital where aeronautical facilities are certainly more advanced. The model of verification and the use of these tuning-forks is a way to short-circuit uneven development.



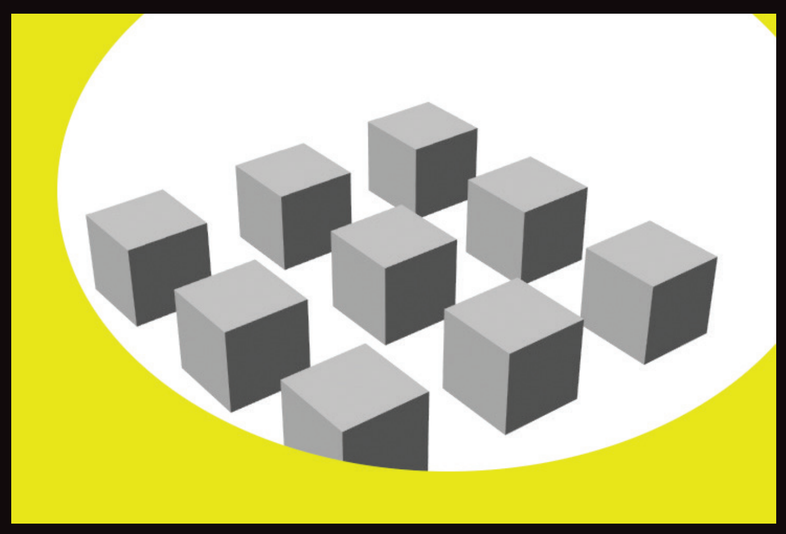
Calibration Model: Aliaz Mountain
Origin: The National Renewable Energy Center (CENER)
Inception: 2013



Calibration Model: Askervein Hill
Origin: International Energy Agency Program of Research and Design
Inception: 1980

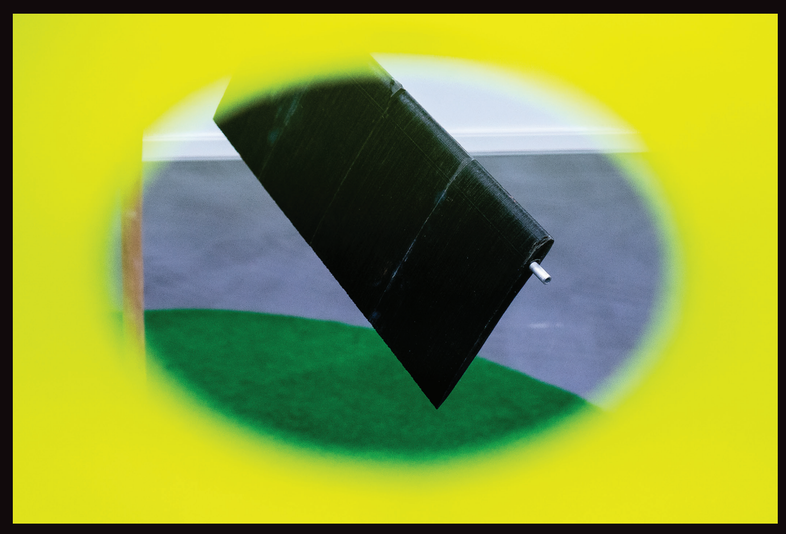


Calibration Model: Bolund Hill
Origin: Danish Technical University
Inception: 2007

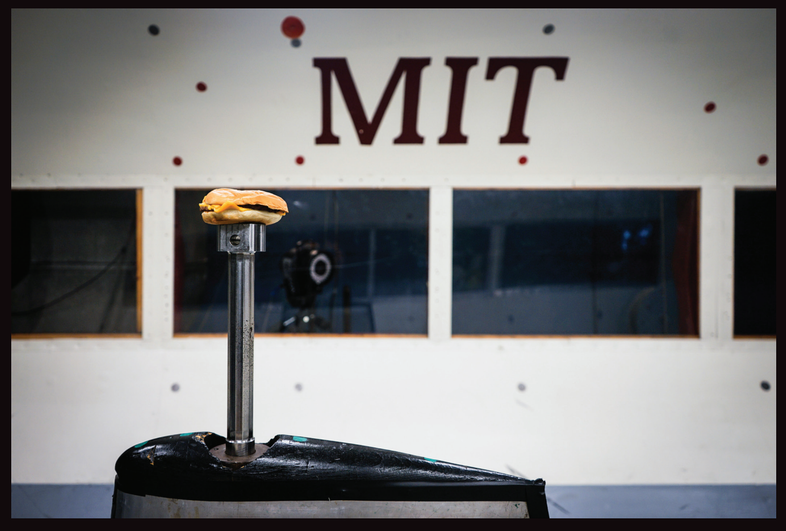


Calibration Model: Idealized Field Nine-Cube Model
Origin: Unknown
Inception: 2002

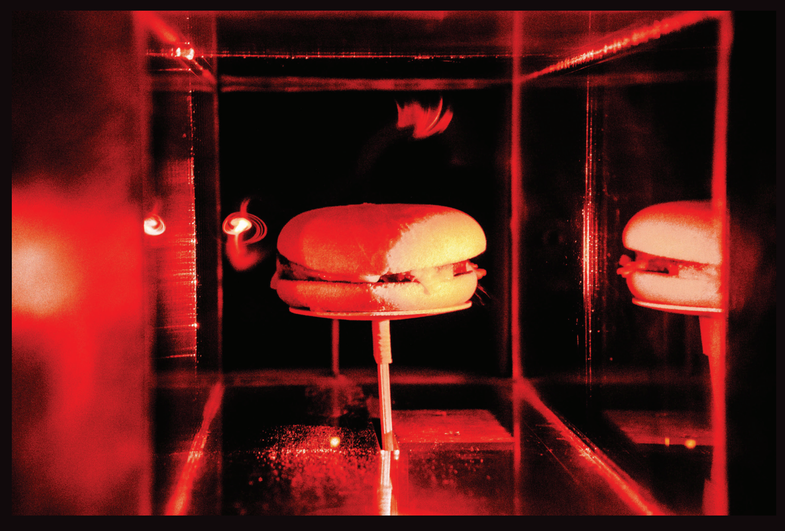
Calibration Model: Oklahoma City
Origin: Environmental Wind Tunnel Laboratory,
Meteorological Institute, Hamburg University, Germany
Inception: 2003



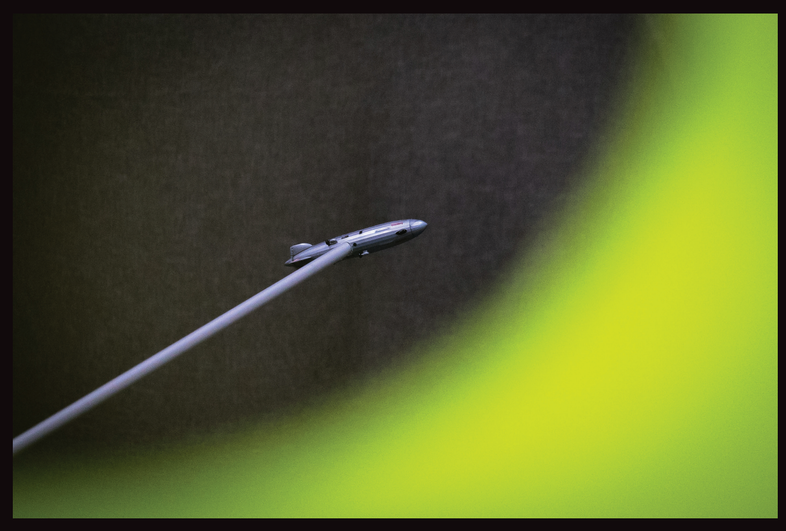
2.3.8
Calibration Model: RAF15 Airfoil
Origin: National Physics Laboratory (UK)
Inception: 1911-21



Calibration Model: McDouble Cheeseburger (McDCM)
Origin: McDonald's Corporation
Inception: 2008 (previous version Double Cheeseburger)



McDouble Cheeseburger flow visualisation in L7 wind tunnel
at von Karman Institute for Fluid dynamics.



Calibration Model: R33 Airship model
Origin: National Physics Laboratory (UK)
Inception: 1916–21

The event would not be possible without the support of:
Prof. Staf Van Tendeloo, head of the EMAT research group at the University of Antwerp; Prof. Olivier Chazot, Prof. at the von Karman Institute; Harlan Levey Projects gallery team; and Werner Van dermeersch, Livin Mentens, and Ruth Loos of Sint Lucas Antwerp University College of Art and Design; Nav Haq and the Museum of Contemporary Art Antwerp (M HKA) team; The Size Matters artistic research group at the Zurich University of the Arts led by Prof. Florian Dombois and supported by the Swiss National Science Foundation; Clara Herrmann and Academy Schloss Solitude.