Ask the Experts….Perception of Motion Criteria for Tall Buildings Subjected to Wind: A Panel Discussion

Moderators

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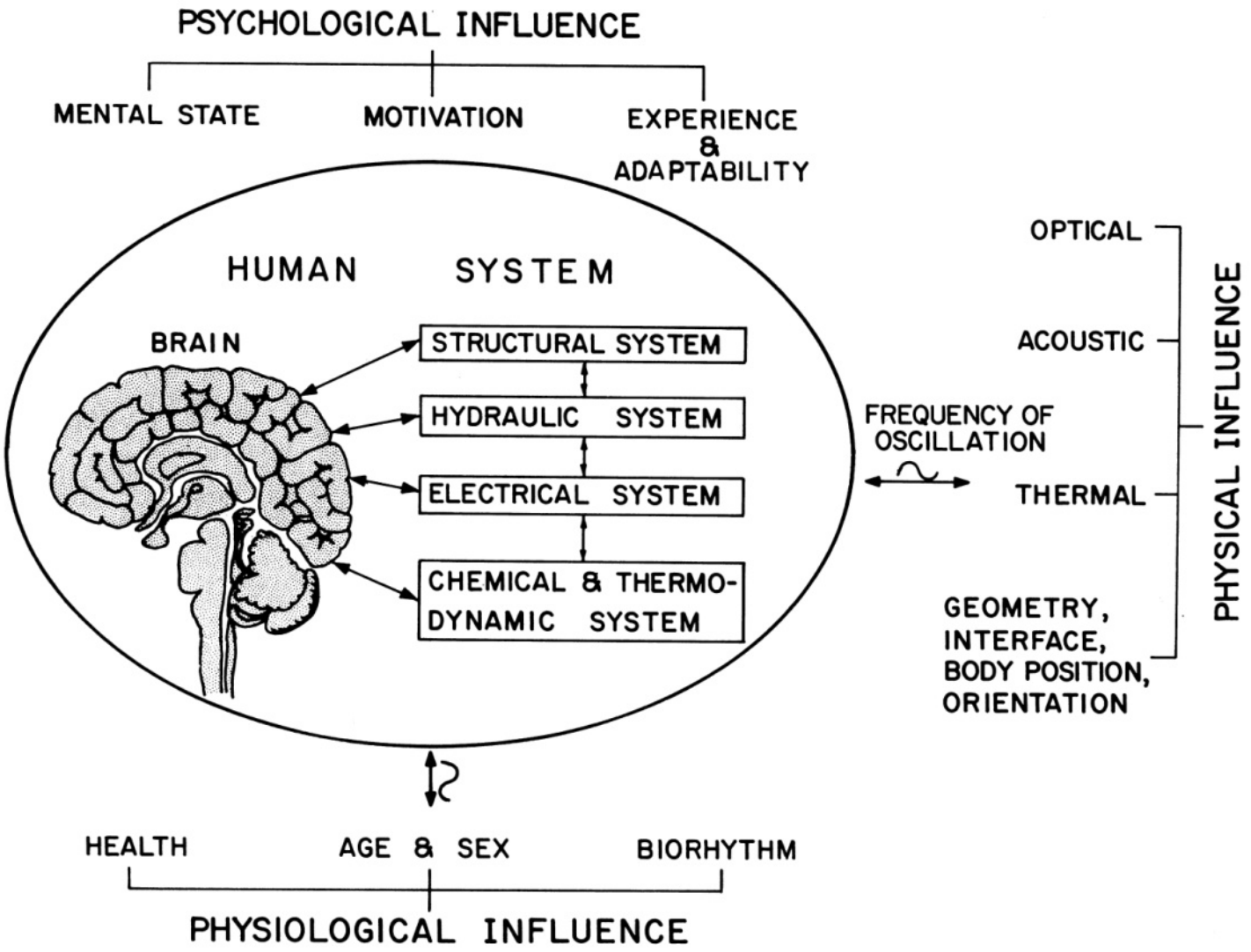
Background

- **Early riders of chariots to modern day concerns in tall buildings human response to motion remains at the forefront**

- **Human biodynamical response to motion is a complex blend of physio-psychological, kinesiological and ergonomical syndromes**

Diagnosing Lively Buildings

Human Biodynamical Response to Motion is a Complex Blend of Psychological, Physiological, Kinesiological, Ergonomical Syndromes.



HUMAN SYSTEM & ENVIRONMENTS

Background contd.

- **Stimulus and response related by a nonlinear transfer function….hardening and softening features**
- **Stimulus used as a criteria, e.g., acceleration/jerk……..RMS/Peak/???**
- **Perception/Comfort consideration/cognitive performance**

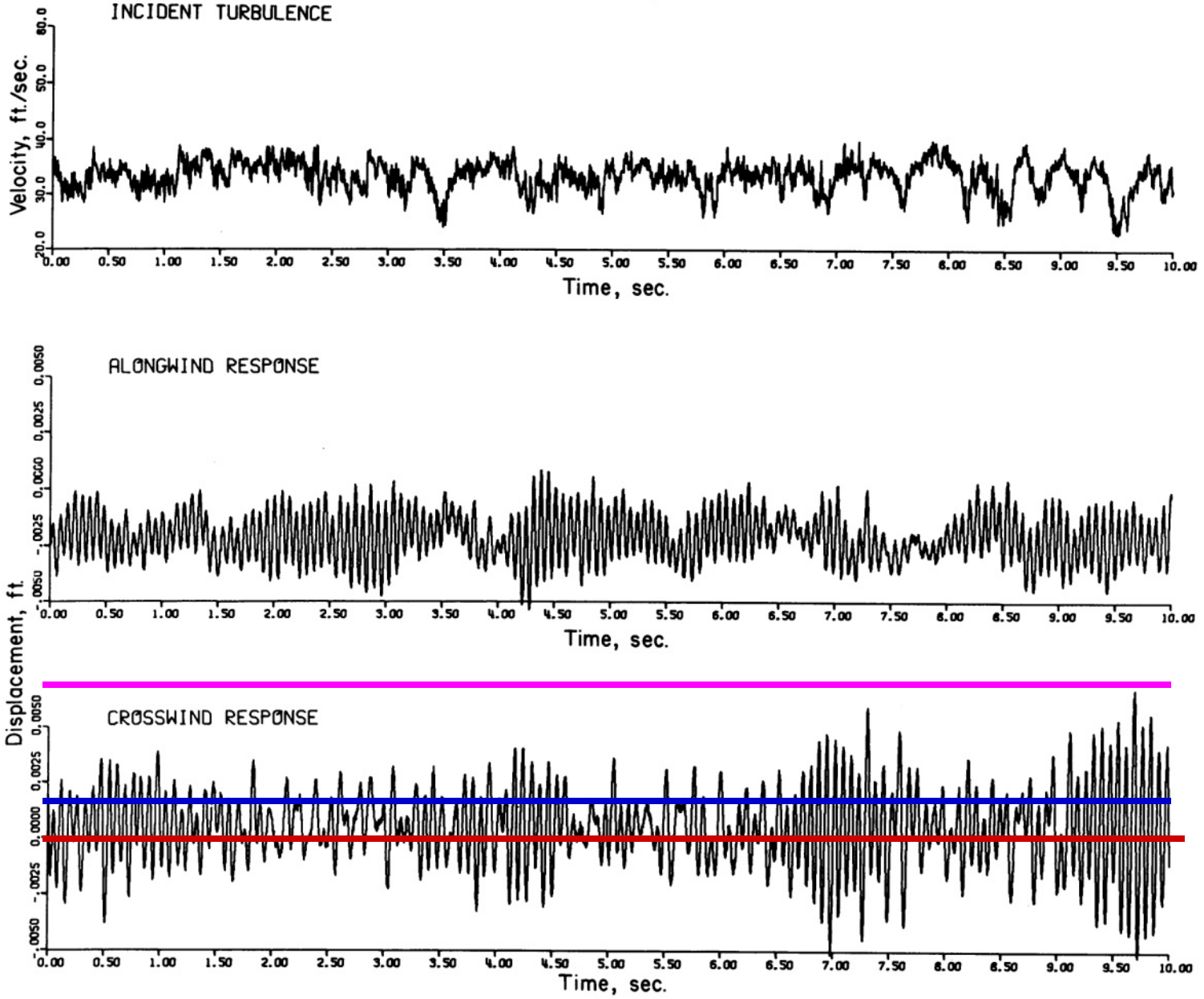
Background contd.

- **ISO-6897…….rms**
- **AIJ……peak**
- **North America peak, 10-15 mg in residential**
  20-25 mg in office….10 yr event

Chen & Robertson (1973); Irwin (1981); Goto (1983)

AIJ/Shimizu; Denoon et al (2001); Melbourne (1980);

Isyumov (1993); Parmalee & Khan (); Hansen et al (1973) 5 mg rms….6 yr event; Kareem (1990) 8 mg rms…10 yr event


INCIDENT TURBULENCE
Velocity, ft./sec.
80.0
60.0
40.0
30.0
20.0
0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.00 9.50 10.00
Time, sec.
ALONGWIND RESPONSE
Displacement, ft.
.0050
.0025
.0000
-.0025
-.0050
0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.00 9.50 10.00
Time, sec.
CROSSWIND RESPONSE
.0050
.0025
.0000
-.0025
-.0050
0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.00 9.50 10.00
Time, sec.
Peak
RMS
Mean

RMS versus Peak

- **Statistical measures of stimulus**
- **Defining motion perception**
- **Defining human perception and acceptance**
- **Time of exposure above threshold**
- **Role of repeated spikes in response**
- **Cognitive ability**