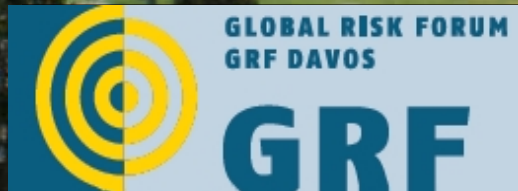


Global Risk Forum Davos



David Alexander
GRF - Davos (CH)



- Founded in 2008 by Dr. Walter J. Ammann CEO and President
- Funded by Swiss federal, cantonal and local government, private sector, other sources.
- Three biennial International Disaster and Risk Conferences (2006-2010) held: a fourth is planned for August 2012.
- Network of collaboration with 12 UN organisations, 40 international organisations and many academic and research institutions.
- Formal co-operation agreements with EU, UN, China, Singapore, etc..



GRF Pillars

**IDRC
Davos
Biennial
International
Conference**

**IDRC
regional
conferences
and
workshops**

Risk Academy

**Think-tank
Issue and
knowledge
management
Training
courses
Public
awareness
E-journal
(good practice)**

Planet@risk

**Web-based
networking
platform
Stakeholder
management**





GRF Davos Risk Academy is a think-tank for risk reduction, disaster management, climate change and other risk issues.

Awareness raising

- exhibitions
- movie screenings
- public round tables

Education

- training courses
- workshops
- public lectures
- publications

GRF Risk Academy

Services & Products

- e-journal
- regular updates
on global risk
- GRF edited books

R&D

- project development
on integrated risk
management

Current GRF Projects:-



- a programme of serial publications
- two major international conferences
- a suite of disaster management courses
- a series of research proposals on disaster risk reduction and resilience.

GRF One Health Summit 2012

One Health – One Planet – One Future
Risks and Opportunities

19-23 February 2012
Davos, Switzerland





From Thought to Action

**4th International
Disaster and Risk Conference
IDRC Davos 2012
Integrative Risk Management
in a Changing World**

**26- 30 August 2012
Davos / Switzerland
with pre- and post-conference
events**

For up-to-date information
and to sign up for our
newsletter please visit
www.grforum.org

Earthquakes and Housing

How to Develop a Survival Strategy



Recent research by **David Alexander**

Characterisation of damage for assessment of personal risk level



Damage level 1:
minimum

Damage level 2:
mainly non-structural



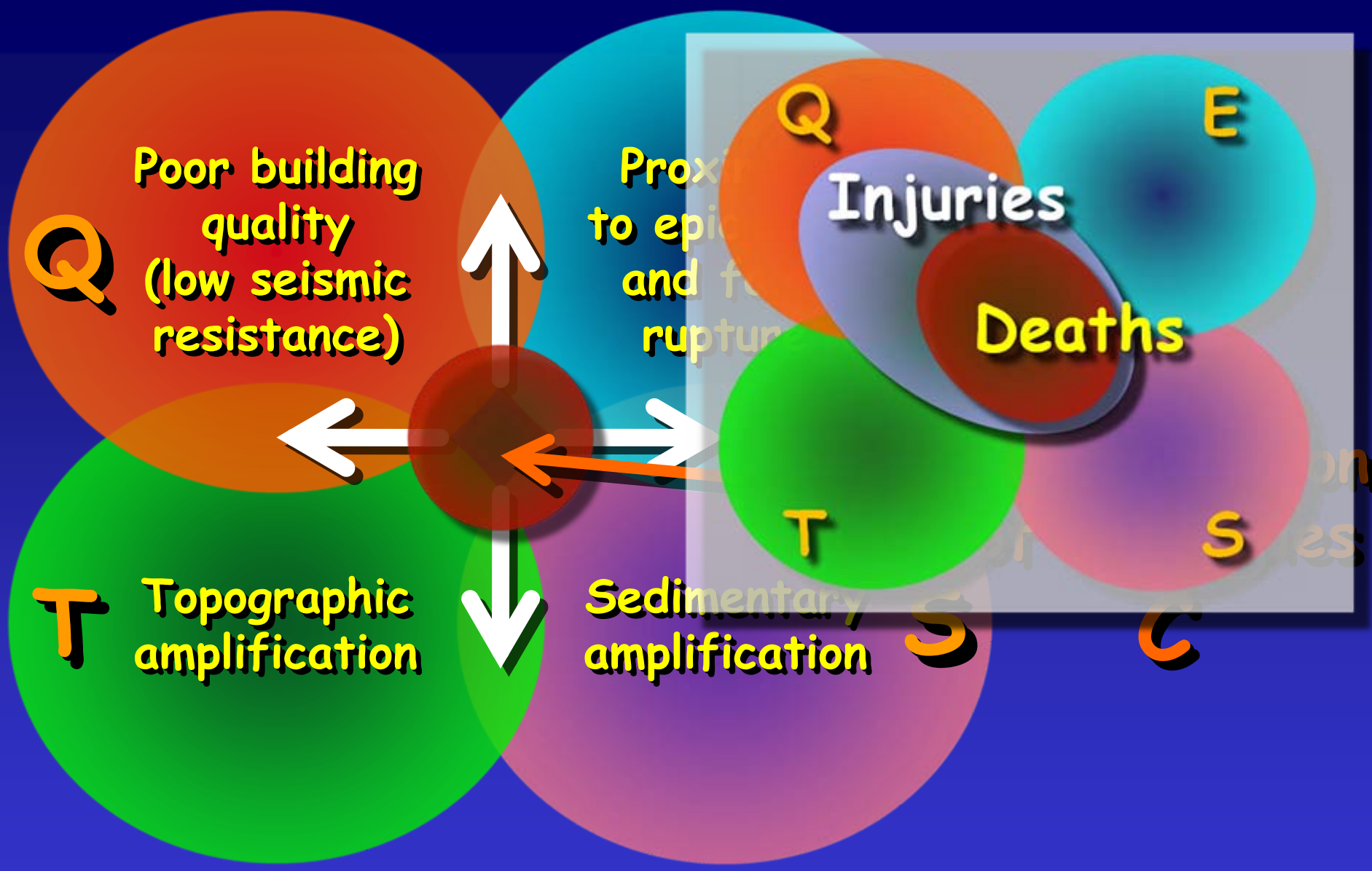
Damage level 3:
architectural



Damage level 4:
serious structural



Damage level 5:
collapse



$$C = f\{E, Q, S, T\}$$

The 2009 L'Aquila (Italy) earthquake



03.32 hrs, Monday 6 April 2009

Magnitude Mw 6,3

Duration 25 seconds

Acceleration on hard rock 0,3g

Acceleration on sediments 0,7-1,0g

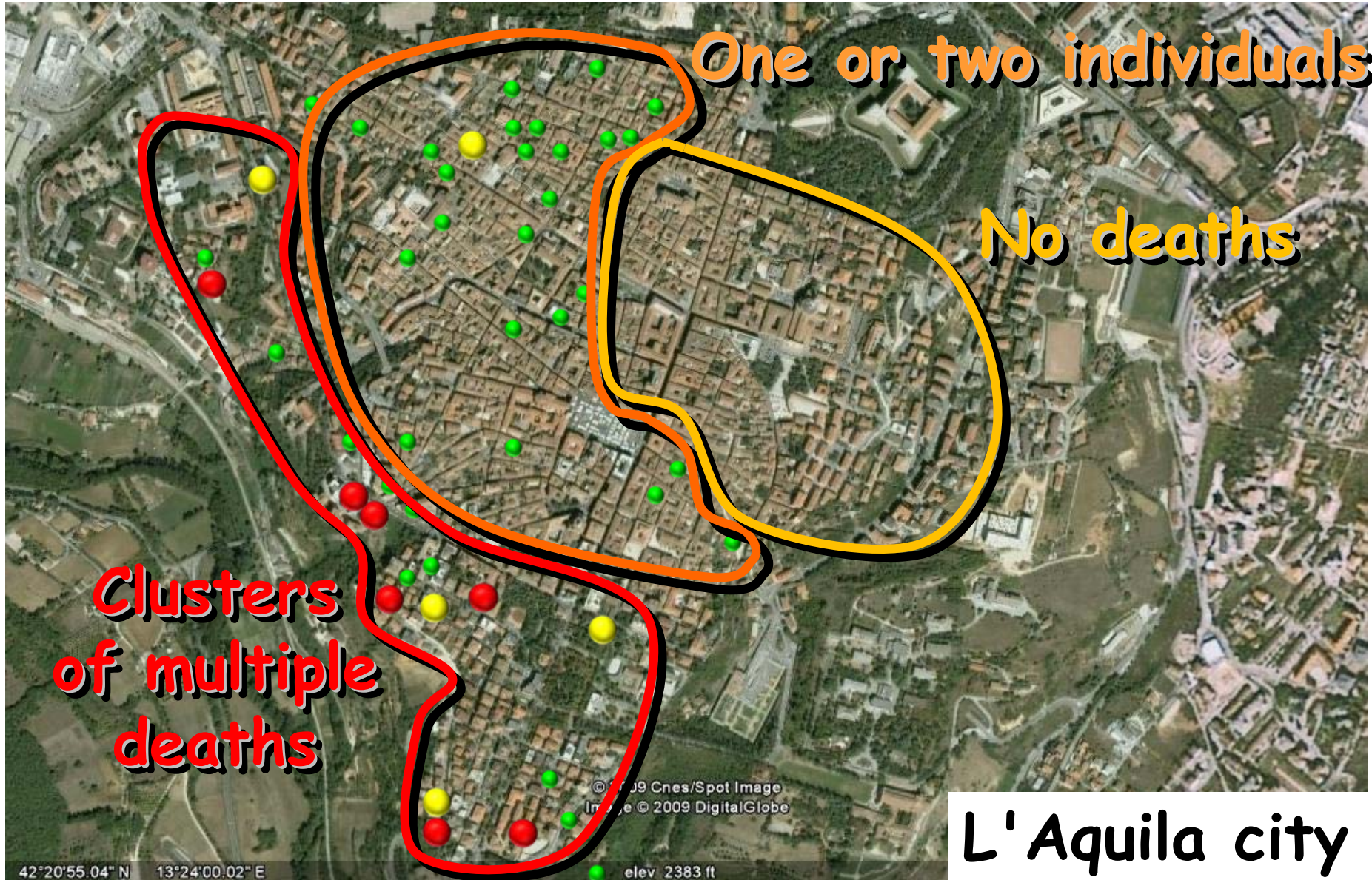
Part of an earthquake swarm from

October 2008 to July 2009

308 deaths, 1500 injuries.

n=202

● 6-25 deaths ● 3-5 deaths ● 1-2 deaths



No deaths:
housing stock was
in relatively good
condition and
damage was limited

Damage/risk
scale: 1-2



One or two individuals:
people rushed outside
and were killed by
falling masonry

Damage/risk
scale: 3-4





**... or in
the collapse
of stairwells.**



Clusters of multiple deaths: spectacular collapses of multi-occupancy buildings with up to 25 deaths each: topographic amplification was an additional factor.

Damage/risk scale: 5

Mid-floor damage to multi-occupancy bldg:

Intertia effect

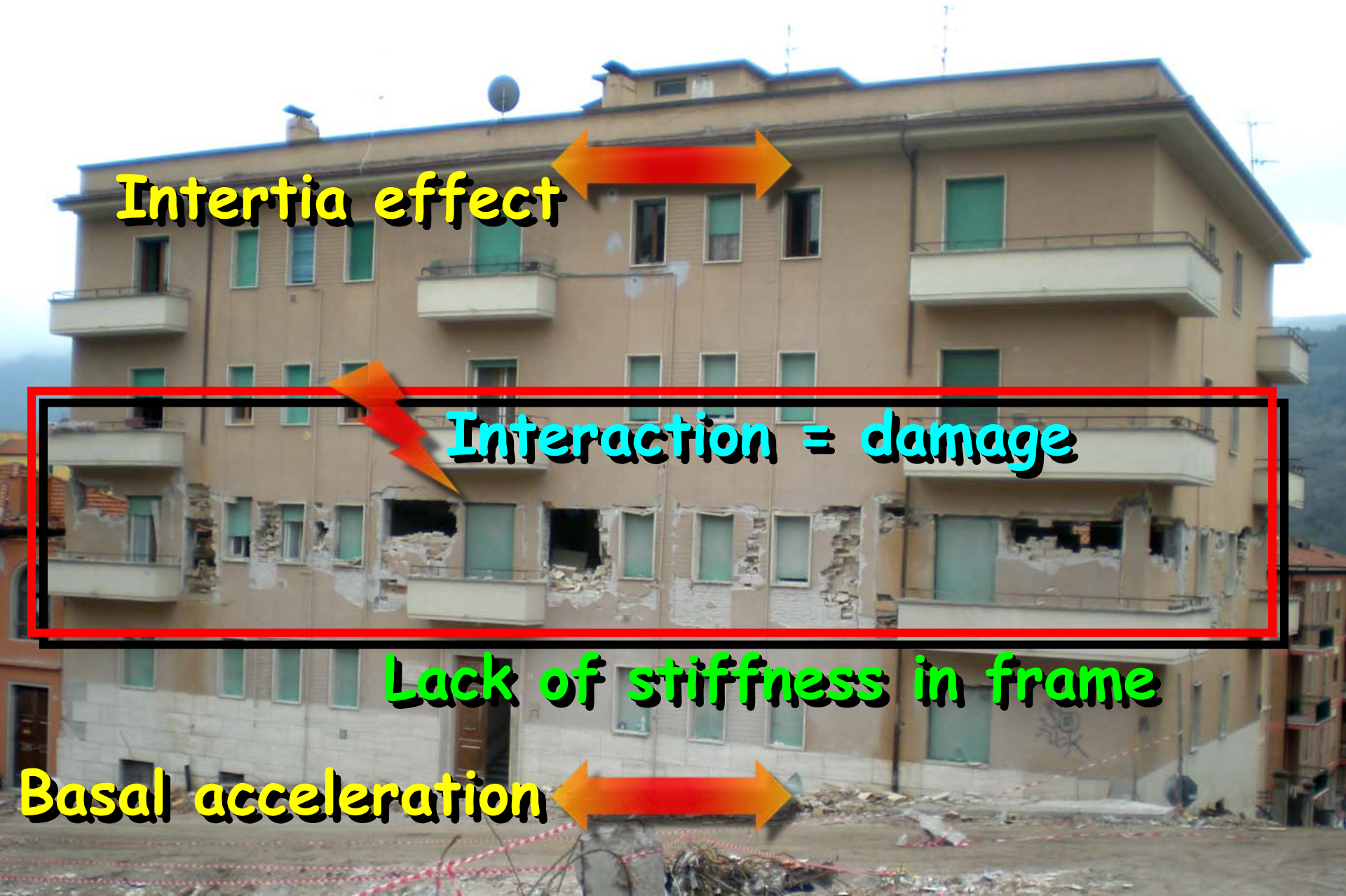


Interaction = damage



Lack of stiffness in frame

Basal acceleration



Models of typical vernacular housing building types



Analysis of characteristic failure modes



Determination of appropriate crisis behaviour



Education and training of households



Culture of protection and resilience





*Disaster Planning and
Emergency Management*

David Alexander

emergency-planning.blogspot.com

www.slideshare.net/dealexander

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