



UNIVERSITÀ DEGLI STUDI DI GENOVA

DICAT

Dipartimento di Ingegneria delle Costruzioni, dell'Ambiente e del Territorio

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AVVISO DI SEMINARIO

“Lateral migration in sinuous submarine channels - Observations
& models with application to hydrocarbon reservoirs”

Carlos Pirmez

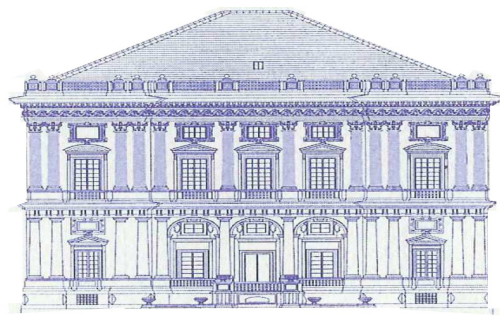
Shell International Exploration & Production
Houston, Texas, USA

Martedì 7 aprile, 2009 – ore 16.00

Facoltà di Ingegneria

Aula A11, atrio DICAT

Villa Giustiniani Cambiaso



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“Lateral migration in sinuous submarine channels - Observations & models with application to hydrocarbon reservoirs”

Sinuous channel systems are ubiquitous in the modern ocean floor and their ancient counterparts contain large reserves of oil and gas. As a result, there is considerable interest in understanding the mechanisms of evolution of these channel systems, but the interpreted flow and depositional patterns have been highly debated.

The controversy arises, at least in part from the multiple sources of data on sinuous channels. Information on the flow patterns comes primarily from measurements in flume tank channels and from 3D numerical models. Information on the deposits comes primarily from some physical experiments, numerical models, high-resolution 3D seismic images and to some degree from ancient turbidite exposures in outcrops.

Many outcrops interpreted to represent sections across sinuous channels display inclined bedding architecture that indicates relatively gradual lateral migration. However, outcrops only rarely offer sufficient 3D control on the channel geometry in order to unequivocally assess the linkage between flow and deposit patterns. On the other hand, in physical experiments both flow and deposits can be measured, although there are scaling issues and not all measurements are possible. Numerical models circumvent most of these limitations, but in order to reduce computing time some approximations and simplifications are needed.

Numerical models demonstrate that in shallow channels flow overspill suppresses the formation of secondary circulation cells, whereas in most cases, secondary cells similar to those observed in rivers occur near the base of turbidity currents traveling within deep channels. The model results are confirmed by flume tank experiments. Depending on flow conditions and channel geometry, depositional patterns observed in flume tanks, numerical models, and seismic data show a variety of deposit geometries that range from beds dipping toward the outer bank, like in point-bars, to beds dipping toward the inner bank.