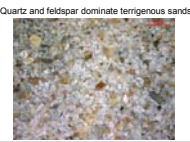


# OSL SENSITIVITY AS A TRACER OF QUARTZ SAND GRAINS IN A COASTAL BARRIER FROM SOUTHERN BRAZIL

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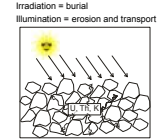
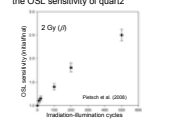
## Introduction

Methods of provenance analysis of sands use minor components (ex. zircon dating)



Provenance analysis based on optically stimulated luminescence (OSL) of quartz

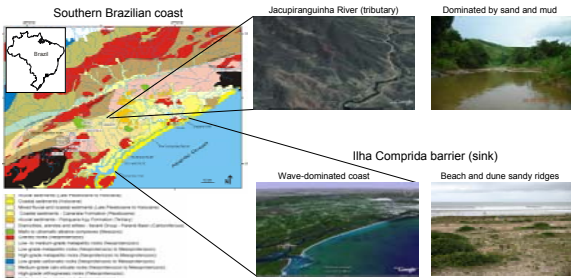
Irradiation and light exposure increase the OSL sensitivity of quartz



Irradiation = burial  
 Illumination = erosion and transport

Is the OSL sensitivity an index of the depositional history of quartz grains?  
 - Sedimentary sensitivity vs. sensitivity inherited from source rocks  
 - Sensitivity of sediments vs. known provenance indicator

## Studied setting



## Methods

### 1. Sampling

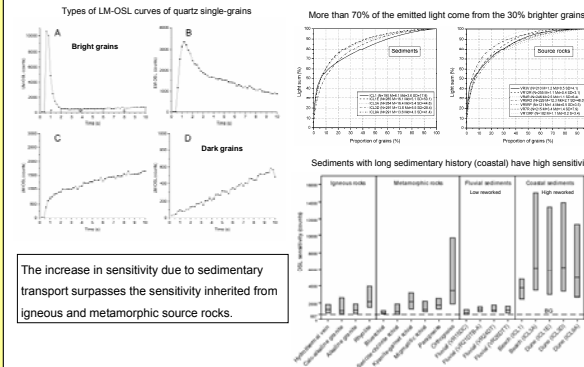
Sample	Bedrock type	Grain size	Location
OSL001	Fluvial sand	Fluvial coarse sand	Ilha Comprida barrier
OSL019	Fluvial sand	Mediately well sorted medium sand	Jacupiranguinha River, Ribeira de Iguape
OSL027	Fluvial sand	Mediately well sorted fine sand	Ribeira de Iguape River, Ribeira de Iguape
OSL028	Fluvial sand	Mediately sorted fine sand	Ribeira de Iguape River, Ribeira de Iguape
OSL031	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL032	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL033	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL034	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL035	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL036	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL037	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL038	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL039	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL040	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL041	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL042	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL043	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL044	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL045	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL046	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL047	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL048	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL049	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida
OSL050	Beach sand	Well sorted fine sand	Ilha Comprida barrier, Ilha Comprida

- Separation of quartz grains: 120-150 µm (aliquots) and 180-250 µm (single grains).
- OSL measurements:
 

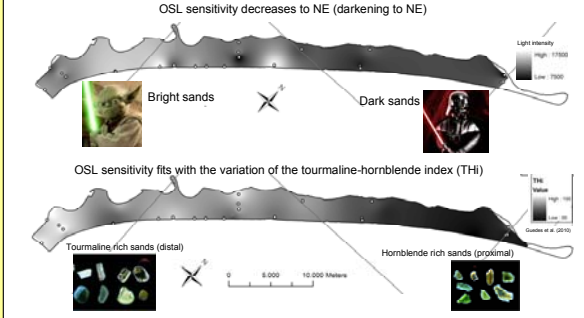
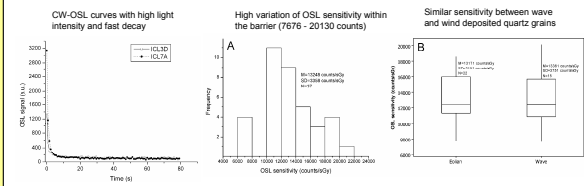
Step	Treatment	Quartz single-grains	Quartz aliquots
1	Bleach at 125°C (5°C/s) for 1s (90% power)		1 Bleach with CW-OSL at 125°C for 1000s with blue LEDs
2	100 Gy $\beta$ irradiation		2 3.98 Gy $\beta$ irradiation (99.6x4.1 mGy/s for 40 s)
3	LM-OSL for 10s at 125°C (5°C/s) (ramp from 0 to 100% power)		3 Measurement of CW-OSL for 100s at 125°C with blue LEDs
- Calculation of OSL sensitivity: integral of the total (single-grains) or the first 2 s (aliquots) of the OSL curves.

## Results

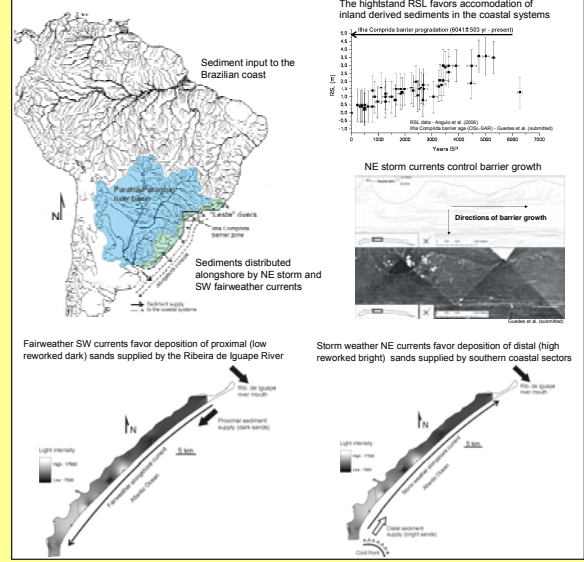
### OSL sensitivity - rocks vs. sediments



### OSL sensitivity within the Ilha Comprida barrier



## OSL sensitivity vs. Provenance



## Conclusions

- The OSL sensitivity indicates the sedimentary history of quartz grains.
- The variation of the OSL sensitivity within the Ilha Comprida barrier fits with the variation of the tourmaline-hornblende index.
- In the Ilha Comprida barrier, the OSL sensitivity of quartz indicates the relative supply of proximal (dark sands) and distal (bright sands) sediments.
- The facility to obtain quartz grains (major component of terrigenous sediments) and the fast way to perform OSL measurements make OSL sensitivity as a valuable provenance tool.

## Acknowledgments

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