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**Abstract:** Quantitative provenance analysis studies are instrumental in understanding the tectonic and climatic processes that are shaping Earth's landscape. Although the most abundant mineral in the sedimentary system is quartz, almost all studies in provenance analysis investigate accessory minerals. Quartz crystals contain a vast number of point defects, intrinsic or due to impurities. For a signal to be an accurate indicator of provenance one needs to show that it is either dose independent or reaches a quantifiable steady state characteristic of the source rock. For signals used by trapped charge dating methods (optically stimulated luminescence (OSL) and electron spin resonance (ESR)), the latter option is the feasible one. By using quartz samples collected from the Chinese Loess Plateau Luochouan loess paleosoil section, we show that the laboratory and natural dose response curves (constructed up to 9000 Gy) of  $E1'$  (paramagnetic oxygen vacancies) as well as the so called (a term used due to the complexity of the signal) peroxy electron spin resonance signals of quartz overlap and reach a steady state for doses over about 1000 Gy. For  $E1'$  signals we attribute this steady state to reaching an equilibrium state between diamagnetic oxygen vacancies (the oxygen deficiency centre (ODC),  $\equiv\text{Si}=\text{Si}\equiv$ ) and paramagnetic oxygen vacancies ( $E1'$ ). For sedimentary quartz irradiated naturally or artificially in this steady state dose range we show a strong linear relationship with zero intercept between  $E1'$  and peroxy signals for samples worldwide, supporting the hypothesis that these defects are Frenkel pairs. Further, we show significant correlations between the optically stimulated (OSL) sensitivity and the above two mentioned ESR signals. The very strong correlations (Pearson's  $r > 0.9$ ) between  $E1'$ , peroxy and OSL sensitivity remain valid after the samples have been heated for 15 min to 350 °C for  $E1'$  to reach its maximum value, believed to be a result of the conversion of the about seven times more abundant diamagnetic oxygen vacancies to  $E1'$ , clearly suggesting a relationship between OSL sensitivity and oxygen vacancies in general. Samples collected from different loess sites around the world can be distinguished based on both these OSL and ESR properties. An empirical increase in OSL sensitivity as well as oxygen related defect concentrations is observed in areas where the source material has components with older detrital zircon U-Pb ages, inferring a positive correlation between OSL sensitivity, as well as the signal intensity for  $E1'$  and so called peroxy defects and the age of the source rocks.

## ID\_023

**Title of the abstract:** Lucas Sátiro do Carmo

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**Abstract:** Beryl is a silicate with chemical formula  $\text{Be}_3\text{Al}_2(\text{SiO}_3)_6$  commonly found in Brazil. It has a few colored variations used as jewelry, like Aquamarine (blueish), Emerald (green) and Heliodor (yellow). In this

work, Heliodor pellets of 5 mm diameter and 1 mm thickness have been produced and investigated using thermoluminescence (TL) to evaluate its potential for use as gamma ray's dosimeter. The results show that the pellets exhibited a prominent TL peak at 205 °C that grows linearly with dose when irradiated from 1 Gy to 1000 Gy. Deconvolution of the TL peaks was carried out using CGCD (Computerized Glow Curve Deconvolution) method. The peak positions were determined using the Tm/Tstop method described in McKeever (1985). Samples were stored in dark room at room temperature for 21 days to evaluate the fading of the TL signal, the main TL peak at 205 °C did not show any decrease in intensity.

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## **ID\_024**

**Title of the abstract:** Brazilian aeolian sediments dating using tl, osl and esr.

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**Abstract:** In this work, a dunefield known as Dama Branca (Brazil) has been dated using the following techniques: Optically Stimulated Luminescence (OSL), Thermoluminescence (TL) and Electronic Spin Resonance (ESR). They are part of what is called "trapped charge dating technique". Sediments have been collected from several points to study age distribution throughout Dama Branca. These ages are related to events of sediment transportation and stabilization. For Dama Branca specifically, variables related to weather such as rainfall and wind power are suspected to be responsible for its formation. OSL results were obtained applying the SAR protocol. TL and ESR results were obtained using the Multiple Aliquot Additive Dose protocol (MAAD). With respect to ESR measurements, the Ti-Li center was chosen for dating since it can be completely bleached by sun light exposure, which makes it suitable for aeolian sediment dating. The Ti-Li center is strongly dependent upon preheat, its stability has been assessed and a preheat temperature of 180 °C was selected. OSL ages are within 0.05 kyears and 2.05 x kyears. TL ages agree with OSL ages for samples collected from the dune base, however there are discrepancies between OSL and TL ages for the DBM2BASE sample, suggesting that it underwent a quicker burial process. ESR results are satisfactory for two samples, 2DB10 and 2DB11 (they follow OSL and TL results). The ages were compared to a simplified morphological study. In recent works about the weather in the Cabo Frio region it has been seen that the studied areas were formed under influence of arid conditions and cold water, variables that control sediment transportation in the region. Keywords (max. 5): TL, ESR, OSL, quartz, sediments dating.

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## **ID\_026**

**Title of the abstract:** OSL signal of electronic components from portable radios for radiation accident dosimetry

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**Abstract:** When a radiological accident occurs, the dose absorbed by the victims must be assessed quickly and accurately in order to select an appropriate medical treatment. In emergency situations where

## POSTER SESSION

Meeting Room: Vangi

### Materials:

14:00-15:00 **Monday 18 September 2023 - Session 2 - MON PM I**

#	ID	Presenter	Title
30	ID_004	Hiroimi Kimura	Optical and optically-stimulated luminescence properties of europium-doped alkali metal bromides translucent ceramics
31	ID_011	Go Okada	Characterization of RPL properties of Bi-doped LiCaBO <sub>3</sub>
32	ID_012	Go Okada	Characterization of RPL properties of Eu-doped CaBPO <sub>5</sub>
33	<u>ID_023</u>	Lucas Satiro do Carmo	Thermoluminescence (TL) Properties of Yellow Beryl Pellets
34	ID_072	Takayuki Yanagida	TSL properties of Ce-doped LiMgAlF <sub>6</sub>
35	ID_073	Ritsuha Tanaka	Development of organic PRL dosimeters based on the radiation-induced reaction of fluorescein and a base generator
36	ID_079	Kiyomitsu Shinsho	Thermoluminescence properties and precise glow curve analysis of Cr, Si, and Mg co-doped Al <sub>2</sub> O <sub>3</sub> ceramics plates to X-rays
37	ID_080	Yuma Takebuchi	Dosimetric properties of Mn-doped MgGa <sub>2</sub> O <sub>4</sub> single crystals
38	ID_082	Hiroto Yamaguchi	Thermoluminescence properties of Tb <sup>3+</sup> -doped B <sub>2</sub> O <sub>3</sub> Na <sub>2</sub> O CaOP <sub>2</sub> O <sub>5</sub> glasses for neutron detection
39	ID_083	Toshiya Endo	Improvement of the radiation sensitivity of electrochromic dyes-doped poly(methyl methacrylate) films via sensitizer addition
40	ID_108	Pamella Oliveira	Production and characterization of OSL films based on Brazilian natural fluorite
41	ID_118	Daniel Vasconcelos	Development of Ce <sup>3+</sup> -doped magnesium borate glass-ceramic for optically stimulated luminescence dosimetry
42	ID_122	Masanori Koshimizu	Thermoluminescence Properties of BCNO phosphors
43	ID_123	Daisuke Nakauchi	Scintillation properties of rare-earth-doped LaMgAl <sub>10</sub> O <sub>19</sub> single crystals with NIR luminescence
44	ID_141	Matheus Nunes	An in-depth study of the OSL response of Brazilian natural alexandrite
45	ID_159	Kai Okazaki	Optically stimulated luminescence properties of In-doped CsBr translucent ceramics
46	ID_161	Kensei Ichiba	Luminescence and dosimetric properties of undoped and Eu-doped LiCl transparent ceramics
47	ID_183	Michał Sądel	Optically stimulated luminescent response of the LiMgPO <sub>4</sub> silicone foils to protons and its dependence on proton energy
48	ID_185	Volkan Altunal	Sol-Gel Synthesized Alkaline Aluminates as Potential OSL Dosimeters: Luminescence Characterization and Dosimetric Properties

49	ID_196	Maciej Budzanowski	Special thermoluminescent MCP-N (LiF:Mg, Cu, P) detectors with better angular dependence
50	ID_222	Nilo F. Cano	Study of the TL dosimetric properties of lithium silicate phosphor for gamma dosimetry
51	ID_227	Helen Khoury	Evaluation of luminescence response of co-doped MgB <sub>4</sub> O <sub>7</sub> :Tm,Li
52	ID_234	Ewa Mandowska	Spectrally resolved thermoluminescence spectra of beta irradiated copper-doped potassium sulphate
53	ID_235	Sonia Hatsue Tatumi	TL, OSL and TA-OSL properties of Au-doped Li <sub>2</sub> B <sub>4</sub> O <sub>7</sub>
54	ID_251	Igor Plokhikh	Exploring the relation between TL peak shape and dosimetric properties in MgB <sub>4</sub> O <sub>7</sub> :Ce,Li
55	ID_264	Yuta Hiramatsu	Thermoluminescence Properties of Tb and Sm co-doped LiTaO <sub>3</sub>
56	ID_265	Keiichiro Miyazaki	Radiation-induced luminescence properties of Eu-doped RbI single crystals
57a	ID_274	Lucas Amorim	Evaluation of the TL/OSL Response Of Lithium Tetraborate Doped With Cerium Produced by the Water Assisted Solution Method
57b	ID-294	Roseli Künzel	Microwave-hydrothermal synthesis, structural, optical and thermoluminescent properties of BaMoO <sub>4</sub> :Gd <sup>3+</sup> phosphors
130	ID_296	Dagmara Kulig	Influence of painting on the light output of 3D printed plastic scintillators
135	ID_186	Mads Lykke Jensen	Mapping radiotherapy dose distributions with optically stimulated luminescence materials