

**QUARTZ LUMINESCENCE DISCRIMINATES STRATIGRAPHIC SEQUENCES
AND INDICATES CHANGES IN PALEORELIEF OF SEDIMENT SOURCE
AREAS OF SANDSTONES FROM THE PARNAÍBA BASIN**

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RESUMO – The sensitivity of optically stimulated luminescence (OSL) and thermoluminescence (TL) signals of quartz from Pleistocene and Holocene sediments has been used as a proxy for provenance and past environmental conditions of source-to-sink sedimentary systems. Here, we use a similar approach to investigate the application of OSL, IRSL and TL sensitivities to discriminate Silurian to Triassic siliciclastic sedimentary units of the Parnaíba basin and to infer the geomorphic conditions of sediment source during basin filling. We also explore the position of the well-known “110 °C” (TL₁₁₀) and “325 °C” (TL₃₂₅) TL peaks of quartz as proxies to discriminate stratigraphic units. Luminescence measurements were carried out on sand grains and statistical tests were applied to evaluate differences in the luminescence characteristics between and within stratigraphic units. OSL and TL sensitivities progressively increase from Silurian to Triassic sedimentary units as well as the dominance of the so-called fast OSL component of quartz, while the IRSL decreases towards younger stratigraphic units. This pattern points to source areas with increasing lower relief and higher sediment recycling from within the basin over time. The TL₁₁₀ peak position is uniform, without significant differences among stratigraphic units, but the TL₃₂₅ peak position has significant variation from 324 to 334 °C. The possible causes for variations in the studied luminescence characteristics are discussed. These luminescence characteristics of quartz are potential new tools to apply in stratigraphic analysis of siliciclastic successions and for interpreting geomorphic conditions during basin evolution.

PALAVRAS-CHAVE: OSL and TL sensitivity; Provenance; Sediment recycling; Source to sink; Parnaíba Basin.