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# Sequence stratigraphy of the Apt Basin lacustrine system, southeastern France, through the late Eocene - earliest Oligocene

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## Résumé

The Manosque Basin hosts deposits of Eocene-Oligocene lake systems that were part of a much wider network of evaporative lakes and lagoons spread over the European Cenozoic Rift System (ECRIS). The onset and mechanisms of ECRIS basin subsidence in southeastern France, the inter-connectivity of these lakes, a possible connection to the sea, and the origin of their evaporative deposits are poorly understood and have been the focus of recent studies in neighboring basins. The Manosque Basin remains yet poorly studied in the light of these questions, and no stratigraphic nor sedimentological work on its lacustrine deposits has been carried out since the early 1990’s. Our work aims at solving these questions by clarifying the stratigraphy of the Apt Basin, the western sub-basin of the Manosque Basin. We correlate and date Eocene-lowermost Oligocene geological units of the Apt Basin in a sequence stratigraphic framework using a basin-wide facies model and a combination of biostratigraphic, magnetostratigraphic and geochronological approaches. We show the existence of three lacustrine phases during the Lutetian, Bartonian-early Priabonian, and Rupelian, all terminated by complete lake dry-up events. The existence of a Lutetian lake system indicates an early onset of basin subsidence before most other ECRIS basins in the area and associated with the late Pyrenean deformation phase. We show the complete hydrological isolation of the Apt basin from other neighboring basins and the unlikelihood of any connection with the sea until at least the early Rupelian. Finally, we show a close synchronicity of the second complete lake dry-up with the Eocene-Oligocene transition, indicating a strong climatic imprint on lake development in the area.

**Mots-Clés:** Eocene, Lakes, Icehouse, Sedimentology, stratigraphy

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