



SBGf Conference

18-20 NOV | Rio'25

Sustainable Geophysics at the Service of Society

In a world of energy diversification and social justice

Submission code: ZRZ5L46MA6

See this and other abstracts on our website: <https://home.sbgf.org.br/Pages/resumos.php>

Relation between silicified faults and evolution of the Cabo Frio High

Davy Raeder Brandão (Universidade Federal Fluminense), Sidney Mello (UFF), Cleverson Guizan (Universidade Federal Fluminense), Ramsés Capilla (PETROBRÁS), Luiz Gamboa (UFF)

Relation between silicified faults and evolution of the Cabo Frio High

Copyright 2025, SBGf - Sociedade Brasileira de Geofísica/Society of Exploration Geophysicist.

This paper was prepared for presentation during the 19th International Congress of the Brazilian Geophysical Society held in Rio de Janeiro, Brazil, 18-20 November 2025. Contents of this paper were reviewed by the Technical Committee of the 19th International Congress of the Brazilian Geophysical Society and do not necessarily represent any position of the SBGf, its officers or members. Electronic reproduction or storage of any part of this paper for commercial purposes without the written consent of the Brazilian Geophysical Society is prohibited.

The Cabo Frio High represents a structural and magmatic feature limiting Santos and Campos Basins. Several examples of faults and magmatic intrusions are pervasive on the continental border from Niterói, to Cabo Frio and Búzios municipalities. These structures present silicified faults that register information about the kinematic of the deformation, helping to decipher the history of the structural evolution in this region. This work intends to investigate how silicified faults accommodate the deformation events of the Cabo Frio High. To achieve this objective the paper present field data of faults and fractures, along with description of the type of lithology deformed to determine the paleostress and infer the chronology of the events. The results show that the Upper Cretaceous evolution starts with a paleotension stress field with SHmax NE-SW with Transtensional to Pure Strike Slip tensors relation. The second phase is related to a permutation of the σ_1 and σ_2 and SHmax NE-SW with Radial Extension to Oblique Extension tensors relation. The third phase has SHmax WNW-ESE with Pure Extensional to Strike-Slip Extensional tensors relation and, the fourth phase has SHmax N-S with Radial Extension to Extensional Strike-Slip tensors relation. The silicified faults present at least five deformational events distinguished by the type of lithology deformed and the superposition of striae in the fault plane. The first deformation was formed during the reactivation process of the continental margin by the intrusion of alkaline rocks at a depth of around 3 - 5 km and reactivated during uplifting registered in the iron-coated and clayed fault planes. The deformation correlates well with the events described for the Continental Rift of Southeast Brazil and the Cabo Frio High, indicating its contemporaneity and structural continuity.