

Brain states are characterised by the interaction among brain regions in a hierarchical manner. Thus, dynamical analysis of interacting brain regions, their associated hierarchy and their temporal transitions are key aspects to understand brain states. This study assesses, for the first time, the hierarchical changes in the brains of the same bipolar patients. We perform a whole-brain analysis of the patient's brain states associated with 3 different moods (i.e. euthymia, depression and mania) as well as compare them with healthy controls. This analysis highlights the reorganization of the brain's hierarchy, leading to different behaviours where depressed brain state is associated with lower functional hierarchy compare to the manic brain state. The results of this study not only shed light on the understanding of bipolar disorder, but also unveils the main brain areas responsible for the transitions among the bipolar moods. This study paves the way for further studies focused on modelling these areas as target regions for treatments, ultimately aiding patients to transit from those states to a healthy one.