Testing the equality of changepoints

Testing for the presence of changepoints and determining their location is a common problem in time series analysis. Applying changepoint procedures to multivariate data results in higher power and more precise location estimates, both in online and offline detection. However, this requires that all changepoints occur at the same time. We study the problem of testing the equality of changepoint locations. One approach is to treat common breaks as a common feature and test, whether an appropriate linear combination of the data can cancel the breaks. We propose how to determine such a linear combination and derive the asymptotic distribution resulting CUSUM and MOSUM statistics. We also study the power of the test under local alternatives and provide simulation results of its finite sample performance. Finally, we suggest a clustering algorithm to group variables into clusters that are co-breaking.