Adaptive Roll-off Factor Utilization in Filter Bank Multicarrier Systems

Background:
Roll off factor $\alpha$ is one of the main parameter that determines the time and frequency characteristics of filters. In conventional systems $\alpha$ is specified by considering the worst cases of the channel. However, in time varying channels, best $\alpha$ value is time varying as well. Since total bandwidth of the signal is changed with $\alpha$ proportionally ($BW = F \times (1+\alpha)$), spectrum can be utilized more efficiently by changing $\alpha$ according to the state of the channel.

System Procedure:
- Channel information is taken or estimated timely
- Best $\alpha$ is selected for corresponding channel state
- Subcarrier spacings are adjusted to prevent overlapping

Open research areas:
- Scheduling of symbols based on their $\alpha$ values
- $\alpha$ optimization techniques for multi-user scenarios

NOTE: Proposed technique is re-designed for multi-user scenarios by allowing subcarriers to have different $\alpha$. Please look at publications for more detail.