# TWO CROSS COUPLED KALMAN FILTERS FOR JOINT ESTIMATION OF MC–DS–CDMA FADING CHANNELS AND THEIR CORRESPONDING AUTOREGRESSIVE PARAMETERS  (MonPmPO1)

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**Abstract :**

This paper deals with the estimation and equalization of time–varying Rayleigh fading channels for synchronous Multi–Carrier Direct–Sequence Code Division Multiple Access (MC–DS–CDMA) systems. The approach we propose operates in three steps. Firstly, decorrelating filtering is carried out along each carrier to eliminate the Multiple Access Interference (MAI). Secondly, the fading channel responses, modelled by autoregressive (AR) processes, are estimated by using Kalman filtering. Nevertheless, since the AR parameters are also unknown, one has to estimate both the channels and the corresponding AR parameters. Avoiding a non linear approach such as the Extended Kalman Filter (EKF), the method we present is based on two cross coupled Kalman filters.
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**✱ Abstract :**
**(cont.)**

Thirdly, the channel estimates are fed into a frequency diversity Maximal Ratio Combining (MRC) rule for channel equalization and symbol detection. The performances of the proposed approach are investigated under realistic Jakes'
**[continued on the next page]**

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**Abstract :**
**(cont.)**

fading model with slow and fast fading scenarios.