Given a general VAR of the form:

$$\mathbf{X}_t = \mathbf{\Pi}_1 \mathbf{X}_{t-1} + \cdots + \mathbf{\Pi}_k \mathbf{X}_{t-k} + \mu + \mathbf{\Phi D}_t + \varepsilon_t, \quad (t = 1, \ldots, T),$$

the following two specifications of a VECM exist:

$$\Delta \mathbf{X}_t = \mathbf{\Gamma}_1 \Delta \mathbf{X}_{t-1} + \cdots + \mathbf{\Gamma}_{k-1} \Delta \mathbf{X}_{t-k+1} + \mathbf{\Pi X}_{t-k} + \mu + \mathbf{\Phi D}_t + \varepsilon_t$$

where

$$\mathbf{\Gamma}_i = -(\mathbf{I} - \mathbf{\Pi}_1 - \cdots - \mathbf{\Pi}_i), \quad (i = 1, \ldots, k-1),$$

and

$$\mathbf{\Pi} = -(\mathbf{I} - \mathbf{\Pi}_1 - \cdots - \mathbf{\Pi}_k)$$

The $\mathbf{\Gamma}_i$ matrices contain the cumulative long-run impacts, hence if spec=”longrun” is choosen, the above VECM is estimated. The other VECM specification is of the form:

$$\Delta \mathbf{X}_t = \mathbf{\Gamma}_1 \Delta \mathbf{X}_{t-1} + \cdots + \mathbf{\Gamma}_{k-1} \Delta \mathbf{X}_{t-k+1} + \mathbf{\Pi X}_{t-1} + \mu + \mathbf{\Phi D}_t + \varepsilon_t$$

where

$$\mathbf{\Gamma}_i = -(\mathbf{\Pi}_{i+1} + \cdots + \mathbf{\Pi}_k), \quad (i = 1, \ldots, k-1),$$

and

$$\mathbf{\Pi} = -(\mathbf{I} - \mathbf{\Pi}_1 - \cdots - \mathbf{\Pi}_k).$$

The $\mathbf{\Pi}$ matrix is the same as in the first specification. However, the $\mathbf{\Gamma}_i$ matrices now differ, in the sense that they measure transitory effects, hence by setting spec=”transitory” the second VECM form is estimated. Please note that inferences drawn on $\mathbf{\Pi}$ will be the same, regardless which specification is choosen and that the explanatory power is the same, too. If ”season” is not NULL, centered seasonal dummy variables are included. If ”dumvar” is not NULL, a matrix of dummy variables is included in the VECM. Please note, that the number of rows of the matrix containing the dummy variables must be equal to the row number of x. Critical values are only reported for systems with less than 11 variables and are taken from Osterwald-Lenum.