- Viacrozmerné normálne rozdelenie

$$f(x) = (2\pi)^{-p/2}(\det(\Sigma))^{-1/2}\exp\{-1/2(x-\mu)^T\Sigma^{-1}(x-\mu)\}$$

$$\varphi_X(t) = \exp\{it^T\mu - 1/2t^T\Sigma t\}$$

- Wishartovo rozdelenie $M = X^TX \sim W_p(\Sigma, n)$, $X^T = (X_1, \ldots, X_n)$, $X_1, \ldots, X_n$ z $N_p(0, \Sigma)$.

- Podmienené rozdelenia

  - Nech $X = (X_1, X_2)^T \sim N_p(\mu, \Sigma)$, kde $X_1 \in \mathbb{R}^r$ a $X_2 \in \mathbb{R}^{p-r}$.

    $$(X_2|X_1 = x_1) \sim N_{p-r}(\mu_2 + \Sigma_{21}\Sigma_{11}^{-1}(x_1 - \mu_1), \Sigma_{22} - \Sigma_{21}\Sigma_{11}^{-1}\Sigma_{12}).$$

  - $X_1 \sim N_r(\mu_1, \Sigma_{11})$ a $(X_2|X_1 = x_1) \sim N_{p-r}(Ax_1 + b, M) \Rightarrow X = (X_1, X_2)^T \sim N_p(\mu, \Sigma)$, kde $\mu = (\mu_1, A\mu_1 + b)^T$ a

    $$\Sigma = \begin{pmatrix} \Sigma_{11} & \Sigma_{11}A^T \\ A\Sigma_{11} & M + A\Sigma_{11}A^T \end{pmatrix}.$$

- Hotellingovo rozdelenie $\alpha = md^TM^{-1}d \sim T^2(p, m)$, kde $d \sim N(0, I_p)$, $M \sim W_p(I, m)$ nez.