PRMI loss

created: 2019/June/21
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To check out the losses and mode-matching at the same time for PRMI

In [39]:
```python
import matplotlib.pyplot as plt
import numpy as np

%matplotlib inline
```
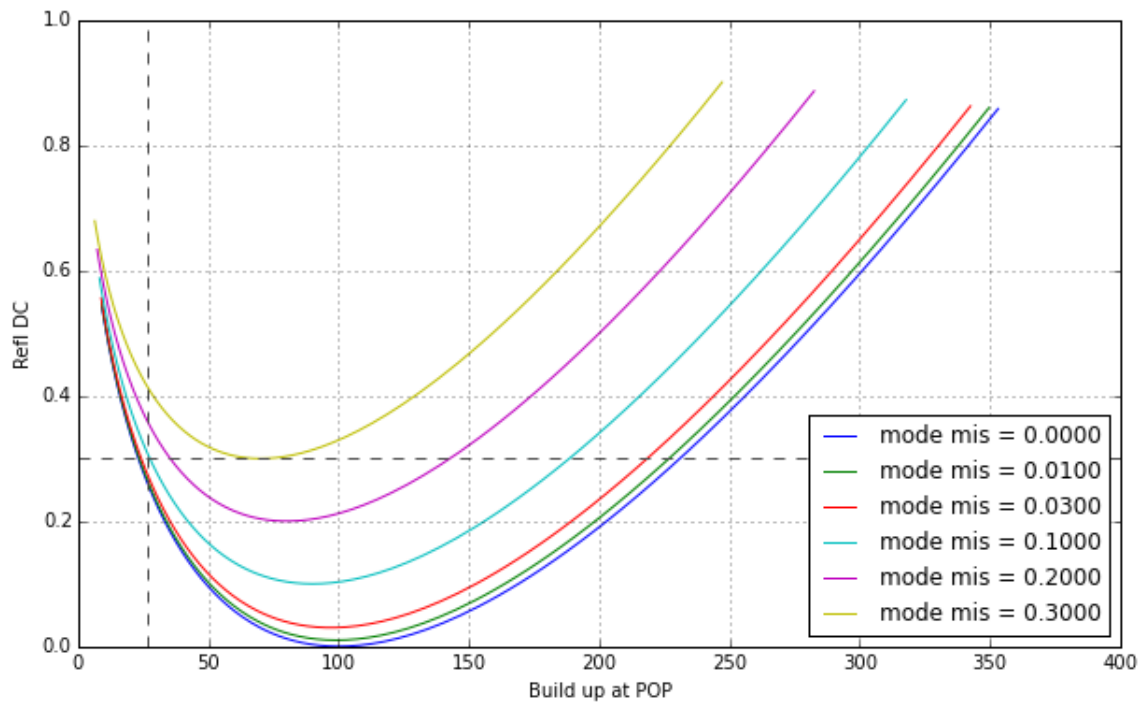
In [40]:
```python
# Definitions
Tp = 0.1
rp = np.sqrt(1 - Tp)
Ti = 0.004

# a function spiting out the refl and buidup ratios.
def RandB (loss, modemismatch):
    eps = modemismatch
    L = loss
    ri = np.sqrt(1. - Ti - L)
    rc = -rp + Tp *ri /(1-ri*rp)
    refl = (eps + (1-eps) * rc**2)
    buildup = (1-eps)/(1. - rp*ri)**2
    return refl, buildup
```

```
In [45]: L = np.linspace(0, 0.5, 256)

         plt.figure(101, figsize=(10, 6))
         for eps in (0, 0.01, 0.03, 0.1, 0.2, 0.3):
             R, B = RandB(L, eps)
             plt.plot(B, R, label='mode mis = %.4f'%eps)
         plt.grid()
         plt.axvline(26.7, ls='--', color='0.3')
         plt.axhline(0.3, ls='--', color='0.3')
         plt.xlabel('Build up at POP')
         plt.ylabel('Refl DC')
         plt.legend(loc='best')
         plt.savefig('RandB_for_PRMI_20190621.png', transparent=True)
         plt.show()
```

In [49]:
```python
R, B = RandB(L, 0.1) # fix the mode mismatch to be 0.1

plt.figure(111, figsize=(10,4))
plt.subplot(121)
plt.title('mode mismatch=10%  assumed')

plt.plot(L, B, color='m', lw=2)
plt.grid()
plt.axhline(26.7, ls='--', color='0.3')
plt.axvline(0.25, ls='--', color='0.3')

plt.xlabel('Intra Cavity Loss')
plt.ylabel('Buildup')


plt.subplot(122)
plt.plot(L, R, color='m', lw=2)
plt.grid()
plt.axhline(0.3, ls='--', color='0.3')
plt.axvline(0.25, ls='--', color='0.3')

plt.xlabel('Intra cavity Loss')
plt.ylabel('Reflection')

plt.savefig('RandB_when_eps0p1_20100621.png', transparent=True)
plt.show()
```