In[129]:=
```
(* BENEFITS OF SHARING INFORMATION IN ITERATIVE LEARNING CONTROL,
Case of Pure Measurement Noise, Angela Schöllig, Oct 2009 *)
```

In[130]:=
```
Remove["Global`*"]
```

In[131]:=
```
pN = (a + b + j b (n a + b)) / ((1 + j (n a + b)) (1 + j b))
```

Out[131]=
$$\frac{a + b + b\,j\,(b + a\,n)}{(1 + b\,j)\,(1 + j\,(b + a\,n))}$$

In[132]:=
```
p11 = Simplify[pN /. n → 1]
```

Out[132]=
$$\frac{a + b}{1 + a\,j + b\,j}$$

In[133]:=
```
Rmeas = Simplify[p11 / pN]
```

Out[133]=
$$\frac{(a + b)\,(1 + b\,j)\,(1 + b\,j + a\,j\,n)}{(1 + a\,j + b\,j)\,(a + b + b\,j\,(b + a\,n))}$$

In[134]:=
```
Expand[Numerator[Rmeas]]
```

Out[134]=
$$a + b + 2\,a\,b\,j + 2\,b^2\,j + a\,b^2\,j^2 + b^3\,j^2 + a^2\,j\,n + a\,b\,j\,n + a^2\,b\,j^2\,n + a\,b^2\,j^2\,n$$

In[135]:=
```
Expand[Denominator[Rmeas]]
```

Out[135]=
$$a + b + a^2\,j + 2\,a\,b\,j + 2\,b^2\,j + a\,b^2\,j^2 + b^3\,j^2 + a\,b\,j\,n + a^2\,b\,j^2\,n + a\,b^2\,j^2\,n$$

In[136]:=
```
FullSimplify[D[Rmeas, b]]
```

Out[136]=
$$-\frac{a^2\,j\,(-1 + n)\,((1 + b\,j)\,(1 + 2\,a\,j + 3\,b\,j) + a\,j\,(1 + a\,j + 2\,b\,j)\,n)}{(1 + (a + b)\,j)^2\,\left(a + b + b^2\,j + a\,b\,j\,n\right)^2}$$

In[137]:=
```
FullSimplify[D[Rmeas, a]]
```

Out[137]=
$$\frac{a\,j\,(1 + b\,j)\,(-1 + n)\,((a + 2\,b)\,(1 + b\,j) + a\,b\,j\,n)}{(1 + (a + b)\,j)^2\,\left(a + b + b^2\,j + a\,b\,j\,n\right)^2}$$

In[138]:=
```
FullSimplify[D[Rmeas, n]]
```

Out[138]=
$$\frac{a^2\,(a + b)\,j\,(1 + b\,j)}{(1 + (a + b)\,j)\,\left(a + b + b^2\,j + a\,b\,j\,n\right)^2}$$

In[139]:=
```
Rmeasb = FullSimplify[Limit[Rmeas, b → 0]]
```

Out[139]=
$$\frac{1 + a\,j\,n}{1 + a\,j}$$

In[140]:=
```
FullSimplify[Limit[Rmeasb, a → Infinity]]
```

Out[140]=
$$n$$