

# Structured Electronic Design

## SLiCAP noise analysis

# SLiCAP Noise Analysis

SLiCAP can perform symbolic and numeric noise analysis

Including noise integration over frequency and correlated double sampling

Circuits should be kept as small as possible (symbolic integration)

# SLiCAP Noise Analysis Settings

Basic settings for noise analysis (**keywords** in blue)

**simType**('symbolic') or **simType**('numeric')

**gainType**('vi')

**dataType**('noise')

# SLiCAP Noise Instructions

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Execute the noise instruction and display the results on an HTML page:

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```
noiseResult = execute()
```

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Execute the noise instruction and display the results on an HTML page:

```
noiseResult = execute()  
htmlPage ('Noise results')
```

# SLiCAP Noise Instructions

Execute the noise instruction and display the results on an HTML page:

```
noiseResult = execute()  
htmlPage ('Noise results')  
noise2html (noiseResult)
```



# SLiCAP Noise Instructions

Obtain the detector-referred noise spectrum from the analysis results and display it on an HTML page

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Obtain the detector-referred noise spectrum from the analysis results and display it on an HTML page

```
oNoiseSpectrum = getOnoise(noiseResult)
```

```
syms('S_VnO')
```

```
eqn2html(S_VnO, oNoiseSpectrum)
```

# SLiCAP Noise Instructions

Obtain the detector-referred noise spectrum from the analysis results and display it on an HTML page

```
oNoiseSpectrum = getOnoise(noiseResult)
```

```
syms('S_VnO')
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eqn2html(S_VnO, oNoiseSpectrum)
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Obtain the contribution of the noise voltage source V1 to the detector-referred noise spectrum from the analysis results and display it on an HTML page

# SLiCAP Noise Instructions

Obtain the detector-referred noise spectrum from the analysis results and display it on an HTML page

```
oNoiseSpectrum = getOnoise(noiseResult)
syms('S_VnO')
eqn2html(S_VnO, oNoiseSpectrum)
```

Obtain the contribution of the noise voltage source V1 to the detector-referred noise spectrum from the analysis results and display it on an HTML page

```
oNoiseSpectrumContribV1 = getOnoise(noiseResult, 'V1')
syms('S_VnoV1')
eqn2html(S_VnoV1, oNoiseSpectrumContribV1)
```

# SLiCAP Noise Instructions

Obtain the source-referred noise spectrum from the analysis results and display it on an HTML page

```
iNoiseSpectrum = getnoise(noiseResult)
syms('S_Vnl')
eqn2html(S_Vnl, iNoiseSpectrum)
```

Obtain the contribution of the noise voltage source V1 to the source-referred noise spectrum from the analysis results and display it on an HTML page

```
iNoiseSpectrumContribV1 = getnoise(noiseResult, 'V1')
syms('S_VniV1')
eqn2html(S_VniV1, iNoiseSpectrumContribV1)
```

# SLiCAP Noise Instructions

Obtain the detector-referred RMS noise from the analysis results and display it on an HTML page (frequency range: f\_min to f\_max)

```
syms('f_min', 'f_max', 'V_nO')
```

```
RMSoNoise = RMSnoise(getOnoise(noiseResult), f_min, f_max)
```

```
eqn2html(V_nO, RMSoNoise)
```

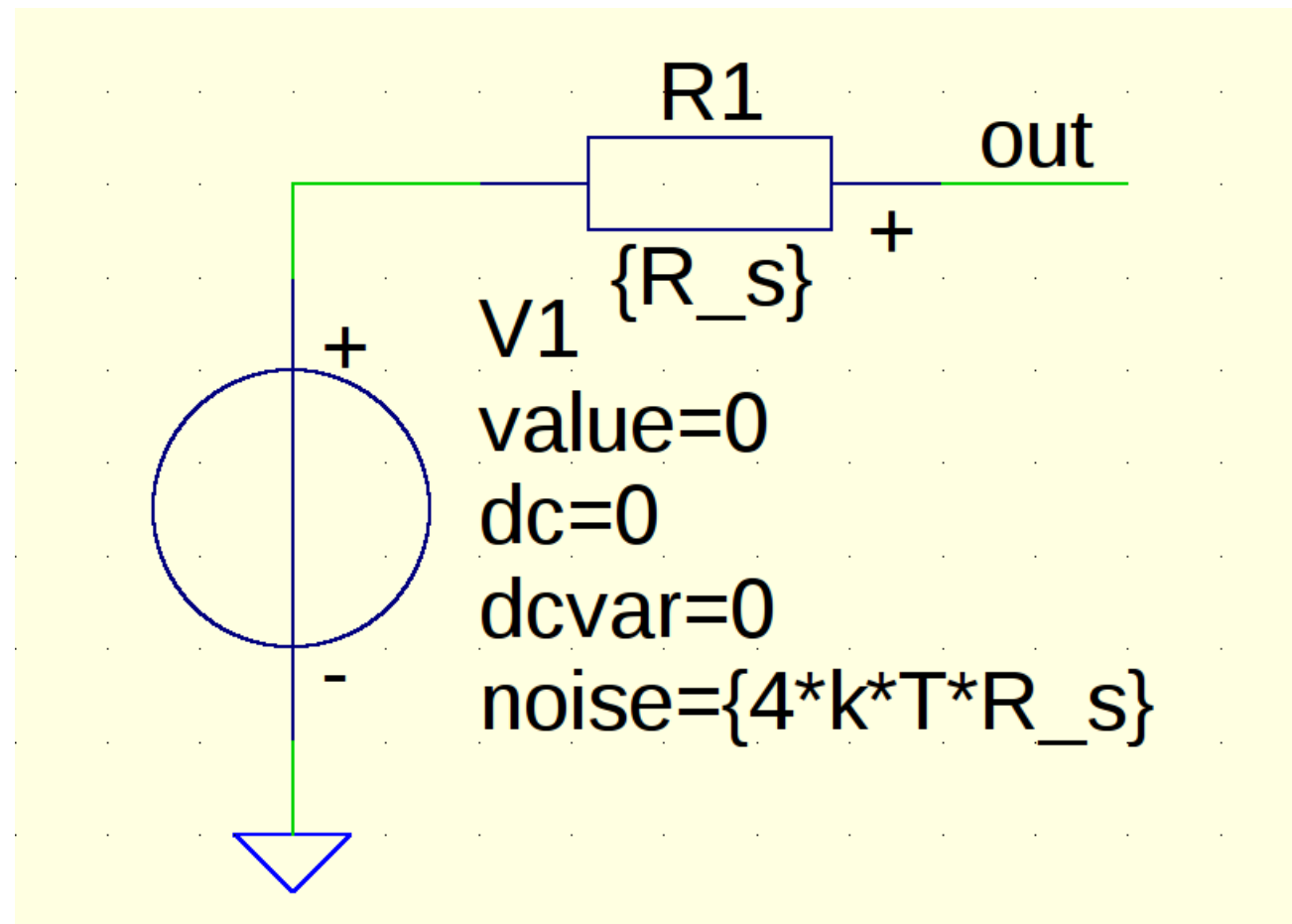
Obtain the contribution of the noise voltage source V1 to the detector-referred RMS noise from the analysis results and display it on an HTML page

```
syms('f_min', 'f_max', 'V_noV1')
```

```
RMSoNoiseV1 = RMSnoise(getOnoise(noiseResult, 'V1'), f_min, f_max)
```

```
eqn2html(V_noV1, RMSoNoiseV1)
```

# SLiCAP Noise Instructions



Just for a start ...

Determine (symbolically)

- Output noise spectrum
- Output RMS noise ( $f_{\min}$  ...  $f_{\max}$ )
- Noise figure