

# Package: ExtendedLaplace (via r-universe)

May 24, 2026

**Title** The Extended Laplace Distribution

**Version** 0.1.6

**Description** Provides computational tools for working with the Extended Laplace distribution, including the probability density function, cumulative distribution function, quantile function, random variate generation based on convolution with Uniform noise and the quantile-quantile plot. Useful for modeling contaminated Laplace data and other applications in robust statistics. See Saah and Kozubowski (2025)  [<doi:10.1016/j.cam.2025.116588>](https://doi.org/10.1016/j.cam.2025.116588).

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**Encoding** UTF-8

**Roxygen** list(markdown = TRUE)

**RoxygenNote** 7.3.2

**Suggests** knitr, rmarkdown, testthat (>= 3.0.0)

**Config/testthat/edition** 3

**VignetteBuilder** knitr

**URL** <https://doi.org/10.1016/j.cam.2025.116588>

**BugReports** <https://github.com/saahdavid/ExtendedLaplace/issues>

**Imports** stats, VGAM

**Repository** <https://saahdavid.r-universe.dev>

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dEL

*Density function of the Extended Laplace Distribution*

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### Description

Density function of the Extended Laplace Distribution

### Usage

`dEL(y, mu, sigma, delta)`

### Arguments

y	Vector of values where the density is to be evaluated
mu	Location parameter
sigma	Scale parameter (must be > 0)
delta	Uniform noise parameter (must be > 0)

### Value

Vector of density values

### References

Saah, D. K., & Kozubowski, T. J. (2025). A new class of extended Laplace distributions with applications to modeling contaminated Laplace data. *Journal of Computational and Applied Mathematics*. doi:10.1016/j.cam.2025.116588

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pEL	<i>Cumulative Distribution Function of the Extended Laplace Distribution</i>
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**Description**

Cumulative Distribution Function of the Extended Laplace Distribution

**Usage**

pEL(y, mu, sigma, delta)

**Arguments**

y	Vector of values where the density is to be evaluated
mu	Location parameter
sigma	Scale parameter (must be > 0)
delta	Uniform noise parameter (must be > 0)

**Value**

Vector of distribution values

**References**

Saah, D. K., & Kozubowski, T. J. (2025). A new class of extended Laplace distributions with applications to modeling contaminated Laplace data. *Journal of Computational and Applied Mathematics*. doi:10.1016/j.cam.2025.116588

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qEL	<i>Inverse Cumulative Distribution Function or Quantile Function of the Extended Laplace Distribution</i>
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**Description**

Inverse Cumulative Distribution Function or Quantile Function of the Extended Laplace Distribution

**Usage**

qEL(u, mu, sigma, delta)

**Arguments**

u	A numeric vector of probabilities.
mu	Location parameter
sigma	Scale parameter (must be > 0)
delta	Uniform noise parameter (must be > 0)

**Value**

Vector of quantiles values

**References**

Saah, D. K., & Kozubowski, T. J. (2025). A new class of extended Laplace distributions with applications to modeling contaminated Laplace data. *Journal of Computational and Applied Mathematics*. doi:10.1016/j.cam.2025.116588

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qqplotEL

*Quantile-Quantile Plot for the Extended Laplace Distribution*

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**Description**

Quantile-Quantile Plot for the Extended Laplace Distribution

**Usage**

```
qqplotEL(sample_data, mu, sigma, delta)
```

**Arguments**

sample_data	A numeric vector of sample data
mu	Location parameter
sigma	Scale parameter (must be > 0)
delta	Uniform noise parameter (must be > 0)

**Value**

A Q-Q plot comparing sample data to the theoretical Extended Laplace distribution

**Examples**

```
sample <- rEL(1000, mu = 0, sigma = 1, delta = 1)
qqplotEL(sample, mu = 0, sigma = 1, delta = 1)
```

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rEL

*Random Sample Generation of the Extended Laplace Distribution*

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### Description

Generates random samples from the Extended Laplace distribution using the convolution representation:  $Y = X + U$ , where  $X \sim \text{Laplace}(\mu, \sigma)$  and  $U \sim \text{Uniform}(-\delta, \delta)$ .

### Usage

```
rEL(n, mu, sigma, delta)
```

### Arguments

n	Integer. Sample size.
mu	Numeric. Location parameter.
sigma	Numeric. Scale parameter (must be $> 0$ ).
delta	Numeric. Uniform noise parameter (must be $> 0$ ).

### Value

A numeric vector of random samples from the Extended Laplace distribution.

### References

Saah, D. K., & Kozubowski, T. J. (2025). A new class of extended Laplace distributions with applications to modeling contaminated Laplace data. *Journal of Computational and Applied Mathematics*. doi:10.1016/j.cam.2025.116588

### Examples

```
rEL(10, mu = 0, sigma = 1, delta = 0.5)
```

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