

# Package ‘ampd’

December 11, 2016

**Title** An Algorithm for Automatic Peak Detection in Noisy Periodic and Quasi-Periodic Signals

**Version** 0.2

**Author** Felix Scholkmann <felix.scholkmann@gmail.com>

**Maintainer** Oliver Sieber <oliver.sieber@gmail.com>

**Description** A method for automatic detection of peaks in noisy periodic and quasi-periodic signals. This method, called automatic multiscale-based peak detection (AMPD), is based on the calculation and analysis of the local maxima scalogram, a matrix comprising the scale-dependent occurrences of local maxima. For further information see <doi:10.3390/a5040588>.

**Depends** R (>= 3.2.0)

**License** GPL

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 5.0.1

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2016-12-11 16:37:19

## R topics documented:

AMPD . . . . .	2
<b>Index</b>	<b>4</b>

AMPD

*AMPD***Description**

Implementation of the automatic multiscale-based peak detection (AMPD) algorithm. AMPD enables to detect peaks in noisy periodic and quasi-periodic signals

**Usage**

```
AMPD(data, L = NaN, extended = FALSE, splitting = FALSE,
      splittingSize = NaN)
```

**Arguments**

<code>data</code>	list containing noisy data with quasi-periodic distribution of local maxima
<code>L</code> ,	maximum number of scales (corresponding to the maximum width of the window used)
<code>extended</code>	default FALSE, if TRUE it uses an optimized algorithm, which is capable to detect Maxima at the beginning and/or the end of the data. This was a bottleneck for the old algorithm. FALSE uses the traditional method.
<code>splitting</code>	default FALSE, splits the data vector to achieve better computation performance. However, with this option, no other parameter than the positions of the maxima will be returned
<code>splittingSize</code>	default NaN, it is recommended to specify a splitting size, otherwise a splitting size of 5000 is used. The splitting size is adapted anyway, so that at least 10 local maxima are included.

**Value**

A list with different variables: LMS (`$LMS`), rescaled LMS (`$rLMS`), position of global minimum of the row-wise summation of LMS (`$minLoc`), position of maxima (`$maximaLoc`). Note that for big data vectors, only the positions of the local maxima will be returned. The others remain empty.

**References**

Scholkmann et al. (2012). An Efficient Algorithm for Automatic Peak Detection in Noisy Periodic and Quasi-Periodic Signals. *Algorithms*, 5 (4), 588-603 <http://www.mdpi.com/1999-4893/5/4/588>

**Examples**

```
t = seq(0,2,0.005)
data = sin(25*t)*sin(0.3*t)+0.4*t
dataNoise = jitter(data,1000)
result = AMPD(dataNoise)
result2 = AMPD(dataNoise, extended=TRUE)
par(mfrow=c(1,2))
```

```
plot(dataNoise, main="traditional algorithm", type="l")
points(result$maximaLoc, dataNoise[result$maximaLoc],col="red")
plot(dataNoise, main="extended algorithm", type="l")
points(result2$maximaLoc, dataNoise[result2$maximaLoc],col="red")
```

# Index

\*Topic **detection**

AMPD, [2](#)

\*Topic **peak**

AMPD, [2](#)

AMPD, [2](#)