

## Publication

Intermittency ratio : a metric reflecting short-term temporal variations of transportation noise exposure

### **JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

**ID** 3648218

**Author(s)** Wunderli, Jean Marc; Pieren, Reto; Habermacher, Manuel; Vienneau, Danielle; Cajochen, Christian; Probst-Hensch, Nicole; Rössli, Martin; Brink, Mark

**Author(s) at UniBasel** [Probst Hensch, Nicole](#) ; [Rössli, Martin](#) ; [Vienneau, Danielle](#) ;

**Year** 2016

**Title** Intermittency ratio : a metric reflecting short-term temporal variations of transportation noise exposure

**Journal** Journal of exposure science and environmental epidemiology

**Volume** 26

**Number** 6

**Pages / Article-Number** 575-585

Most environmental epidemiology studies model health effects of noise by regressing on acoustic exposure metrics that are based on the concept of average energetic dose over longer time periods (i.e. the Leq and related measures). Regarding noise effects on health and wellbeing, average measures often cannot satisfactorily predict annoyance and somatic health effects of noise, particularly sleep disturbances. It has been hypothesized that effects of noise can be better explained when also considering the variation of the level over time and the frequency distribution of event-related acoustic measures, such as for example, the maximum sound pressure level. However, it is unclear how this is best parametrized in a metric that is not correlated with the Leq, but takes into account the frequency distribution of events and their emergence from background. In this paper, a calculation method is presented that produces a metric which reflects the intermittency of road, rail and aircraft noise exposure situations. The metric termed intermittency ratio (IR) expresses the proportion of the acoustical energy contribution in the total energetic dose that is created by individual noise events above a certain threshold. To calculate the metric, it is shown how to estimate the distribution of maximum pass-by levels from information on geometry (distance and angle), traffic flow (number and speed) and single-event pass-by levels per vehicle category. On the basis of noise maps that simultaneously visualize Leq, as well as IR, the differences of both metrics are discussed.

**Publisher** Nature Publishing Group

**ISSN/ISBN** 1559-0631

**edoc-URL** <http://edoc.unibas.ch/44687/>

**Full Text on edoc** No;

**Digital Object Identifier DOI** 10.1038/jes.2015.56

**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/26350982>

**ISI-Number** WOS:000386539500006

**Document type (ISI)** Article