

Speckle Entoptic Perimeter

Entoptic perimetry

Entoptic perimetry is a (forgotten) proven method to reveal an absolute or relative scotoma to the patient by imaging a time-varying noise image on the retina. It was first implemented on a computer screen by Prof. Aulhorn's group in Tübingen, Germany and later by using a retinal scanning display by Prof. Freeman's group at UCSD. For a list of references, also showing the sensitivity and specificity of the conventional method, see: www.opticaldiagnostics.com/ep

Applications

The method is exceptionally well suited for a **screening task for scotomas** that are related to, for example, glaucoma, diabetic retinopathy, macular degeneration, and retinal detachment. Within seconds after imaging the noise field on the retina, the patient will be able to tell the administrator if anything is abnormal with their (peripheral) vision. Next, the patient could be referred to a specialist to be diagnosed further using, for example, a static threshold perimeter.

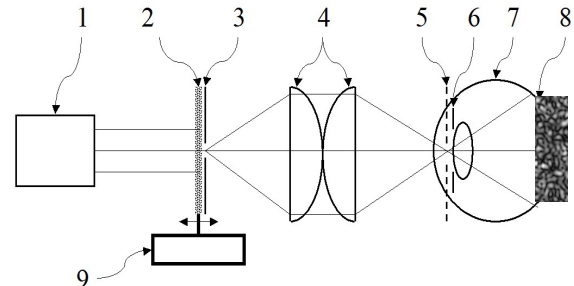
Another important application of the entoptic perimeter is to make the patient aware of the scotoma. Not only for visual tasks (I did not see that car), but also for **compliance with medication**, which is a big issue in especially glaucoma.

Previous limitations

The previous implementations of the entoptic perimetry method (using an imaging display) had the following important limitations:

- only a limited visual field could be tested
- accommodation- or refractive errors or ocular media opacities compromised the results
- limited portability

Invention (patent pending)



A time-varying speckle pattern is created (not imaged!) on the retina to act as the dynamic noise field. For example, in the most basic configuration above a laser diode **1** illuminates a diffuse scattering body **2**. A small aperture **3** is imaged by a lens system **4** into an exit pupil **5**, which is positioned into the entrance pupil of the eye. A moving mechanism **9** slightly changes the position of the scattering body, causing the speckle pattern to change in time.

Advantages

- Short testing time (in the order of seconds)
- Detects also small scotomas
- Very large visual field can be tested
- Accommodation- and refractive error independent (glasses can be omitted!)
- Relatively insensitive to ocular media opacities
- Small, lightweight, handheld (emergency room!)
- Inexpensive to fabricate (no expensive parts and no stringent alignment requirements)

Business opportunities

- Apparatus sales to eye care providers
- Pharmaceutical company involvement
- Static perimeter company licensing

More information can be found at:

<https://www.opticaldiagnostics.com/patent.html>

Contact information: Gerard de Wit, Ph.D.
Zwaluwweg 1
4112 PK Beusichem
The Netherlands
Tel. +31-345-518116
E-mail: dewit@opticaldiagnostics.com