

A bee in the corridor: regulating the optic flow on one side

Franck Ruffier, Julien Serres, Guillaume P. Masson, Nicolas Franceschini

► **To cite this version:**

Franck Ruffier, Julien Serres, Guillaume P. Masson, Nicolas Franceschini. A bee in the corridor: regulating the optic flow on one side. 31st Göttingen Neurobiology Conference - 7th Meeting of the German Neuroscience Society, Mar 2007, Göttingen, Germany. hal-02295700

HAL Id: hal-02295700

<https://hal-amu.archives-ouvertes.fr/hal-02295700>

Submitted on 24 Sep 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

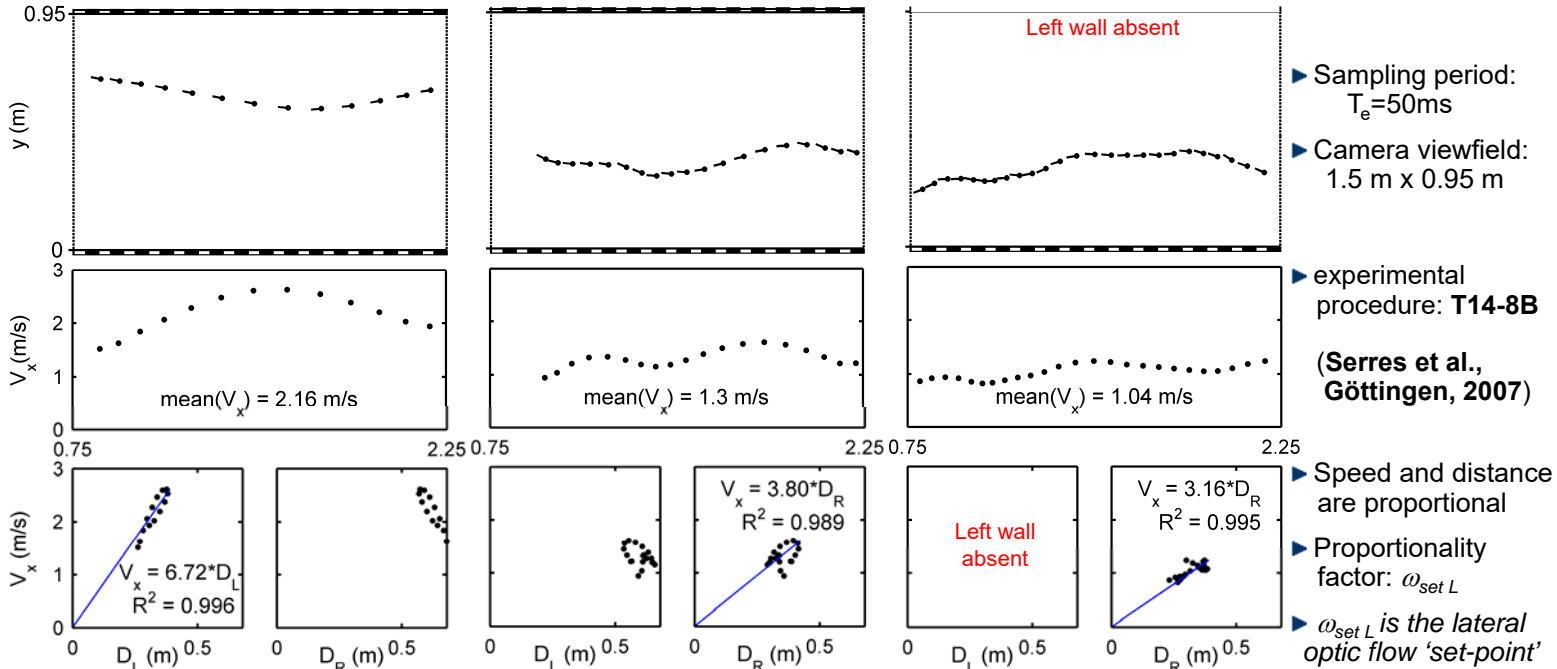
L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

A bee in the corridor: regulating the optic flow on one side

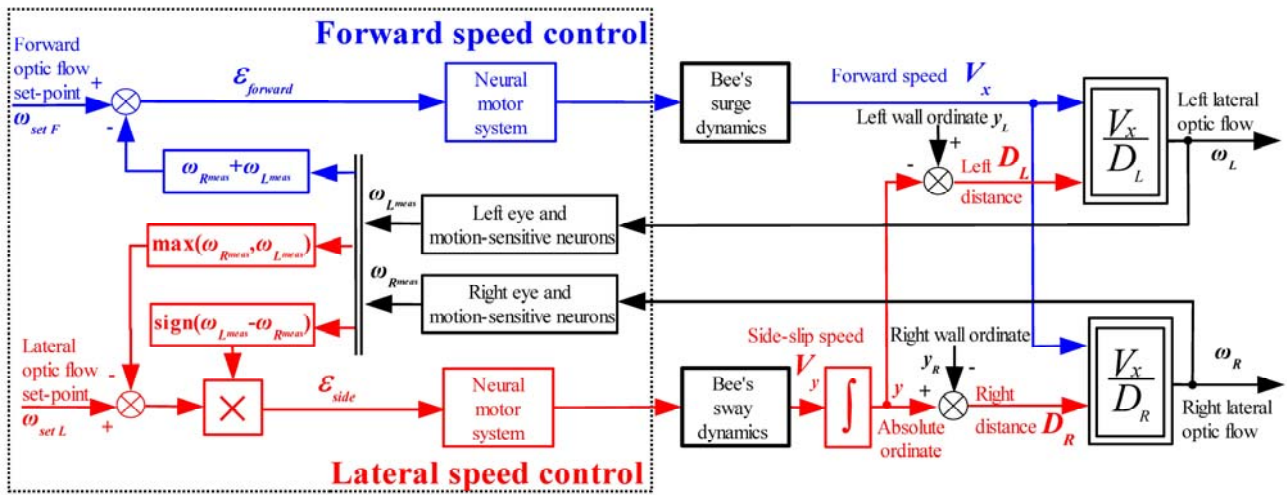
F. Ruffier, J. Serres, G.P. Masson and N. Franceschini

Biorobotics Dpt., Movement and Perception Inst., CNRS/Univ. of the Mediterranean,
163, avenue Luminy, 13288 Marseille Cedex 09 FRANCE e-mail: franck.ruffier@univmed.fr

• Frame by frame analysis of the trajectories of individual bees (*Apis Mellifera*)

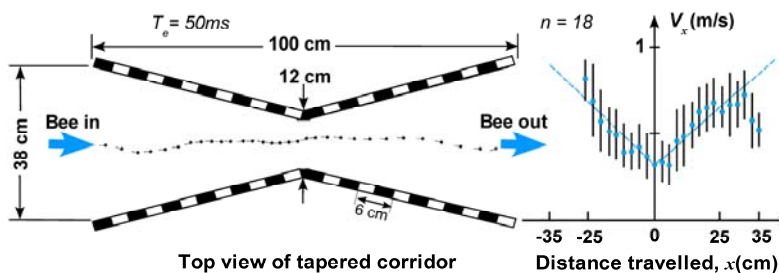


• The dual optic flow regulator for speed control and collision avoidance



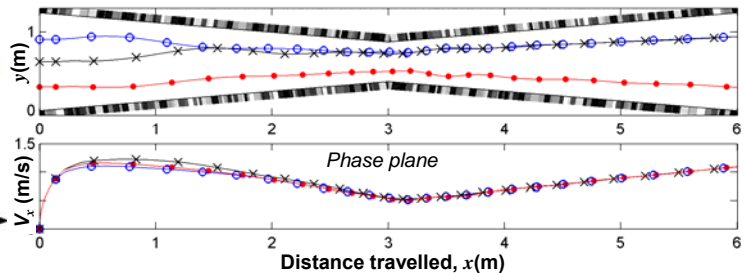
• Actual flight of a bee:

(adapted from Srinivasan, Zhang, Lehrer, Collett, 1996)



• Simulations of a fully actuated hovercraft:

(Serres, Ruffier, Franceschini, Proc. IEEE Biorob, 2006)



• Conclusion

- ▶ Forward speed and distance to one wall are **proportional** to each other, attesting that the lateral optic flow is held constant.
- ▶ The bee's behaviour is well accounted for by a **lateral optic flow regulator** (Serres et al., Proc. IEEE/RAS Biorob 2006)
- ▶ The **dual optic flow regulator** generates behaviours that are similar to those observed in bees (Srinivasan et al., 1996)