

The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$. In the second part, we study the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$.

In the third part, we study the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$. In the fourth part, we study the asymptotic behavior of the solutions of the system (1.1) as $\epsilon \rightarrow 0$.

2. STATEMENT OF THE PROBLEM

Let Ω be a bounded domain in \mathbb{R}^n with smooth boundary $\partial\Omega$. Let Γ be a smooth curve in Ω . Let \mathbf{u} and \mathbf{v} be vector fields in Ω . Let \mathbf{u}_ϵ and \mathbf{v}_ϵ be vector fields in Ω depending on a small parameter ϵ .

2.1. Asymptotic expansion

We assume that the vector fields \mathbf{u} and \mathbf{v} satisfy the following conditions:

- (1) \mathbf{u} and \mathbf{v} are smooth in Ω .
- (2) \mathbf{u} and \mathbf{v} are tangent to $\partial\Omega$.
- (3) \mathbf{u} and \mathbf{v} are tangent to Γ .

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